DOCUMENT RESUME

ED 117 388 95 CE 006 027

AUTHOR	Ailer, Audrey J.; And Others
TITLE	Career Development Exemplary Project. The First Draft of a Curriculum Guide for Grade Nine.
INSTITUTION	District of Columbia Public Schools, Washington, D.C.
SPONS AGENCY	Office of Education (DHEW), Washington, D.C.
NOTE	201p.; For related document, see CE 006 028
EDRS PRICE	MF-$0.83 HC-$11.37 Plus Postage
DESCRIPTORS	Career Awareness; Career Education; *Career Exploration; Career Opportunities; Career Planning; Communication Skills; *Curriculum Guides; *Grade 9; *Learning Activities; Role Playing; Secondary Education; Unit Plan; *Vocational Development

ABSTRACT

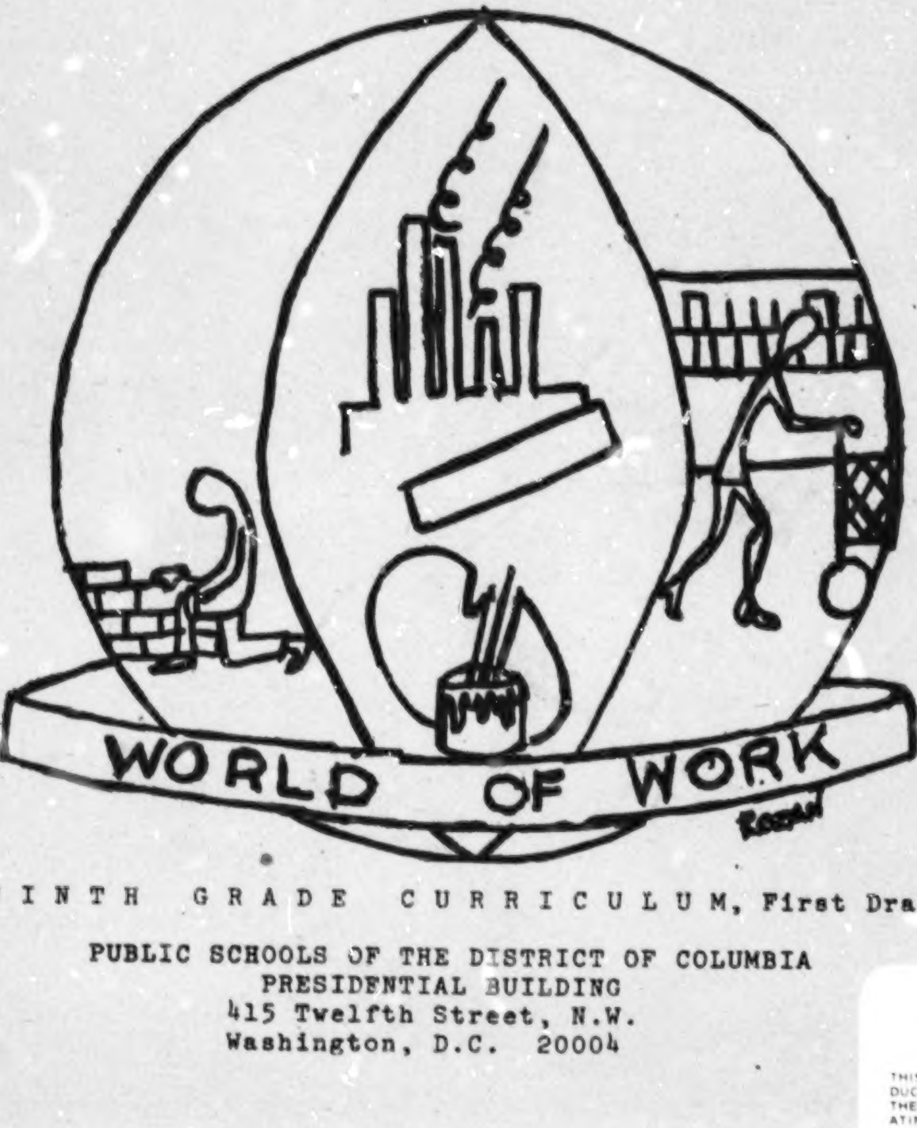
The guide represents an effort to implement the first phase of an exploration of careers curriculum designed to provide in-depth exploration of jobs previously surveyed by students in the seventh and eighth grade career awareness phase of the program. The following three units are included for each of 11 subject areas: an awareness unit, 4 to 9 weeks in lenth, through which the student takes another look at himself and at the subject he is studying in terms of its relevancy to the 10 identified clusters of career opportunities; a communications unit, 9 to 14 weeks in length, during which the student has an opportunity to focus on what each subject contributes to his acquisition of communication skills necessary for success in each cluster of career opportunities; and an exploration unit (one semester in length) which provides each student an opportunity to assume a number of the job roles for which a particular subject prepares him. Each of the three types of units contains objectives, activities, materials and resource lists, and suggested evaluation measures. The subject areas covered in the units are art, business, electronics, English, graphic communications, home economics, mathematics, music, science, social studies, and woodworking. (Author/MS)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

DEC 2 4 1975

ED117388

CAREER DEVELOPMENT EXEMPLARY PROJECT



NINTH GRADE CURRICULUM, First Draft

PUBLIC SCHOOLS OF THE DISTRICT OF COLUMBIA
PRESIDENTIAL BUILDING
415 Twelfth Street, N.W.
Washington, D.C. 20004

CE006027

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

CAREER DEVELOPMENT EXEMPLARY PROJECT

The First Draft of a Curriculum Guide for Grade Nine

Public Schools of the District of Columbia

Dr. Barbara A. Sizemore, Superintendent

Dr. James T. Guines, Associate Superintendent,
Division of Instructional Services

Mrs. Bessie D. Etheridge, Director
Career Development Exemplary Project

Mrs. Ellen F. Datcher, Assistant Director
Career Development Exemplary Project

ACKNOWLEDGEMENTS

We wish to express gratitude to our Project Director who gave able direction for a new focus and to the Supervising Directors of subject fields and their Assistants who provided constructive criticism and other professional assistance.

CAREER DEVELOPMENT EXEMPLARY PROJECT

CURRICULUM TEAM

Curriculum Writer/Editor - Audrey J. Ailer

Coordinator - Ellen F. Detcher

TEACHERS

Art - Rose Ann W. Elliott

Business - Virginia Saxton
Earline Mitchell

Electronics - Donald R. Moore

English - Catherine S. Booker
Ann C. Coluzzi

Graphic Communications - Lynwood F. Williamson

Home Economics - Priscilla G. Kerins
Harriett Richardson

Mathematics - A[illegible]a J. Sullivan

Music - Berdie B. Delaney

Science - Willard Johnson
Doris Mitchell

Social Studies - Anne U. Beard
Homer M. Miller

Woodwork - David A. Lyons

INQUIRIES:

Mrs. Bessie D. Etheridge, Director
Career Development Exemplary Project
Browne Junior High School - Room 205
24th & Benning Road, N.E.
Washington, D..C 20002

These materials were designed under the provision of Part D of Public Law 90-576 of the Vocational Education Amendments of 1968.

PREFACE

This guide represents an effort to implement the first phase of the "Exploration of Careers" curriculum recommended by the Task Force Report on Vocational Education, "A Plan for Career Development" (May, 1969).

The curriculum for grades 7 and 8 provides students a chance to survey job opportunities within the framework of the following ten clusters of careers:

Consumer and Homemaking
Communications and Media
Fine Arts and Humanities
Construction and Environment
Agri-Business, Natural Resources, and Marine Science
Public Service
Health Occupations
Manufacturing, Marketing and Distribution, Business and Office Occupations
Transportation
Hospitality, Recreation and Personal Service Occupations

At the same time students continue to build upon the foundations program provided in the elementary school, acquiring knowledge, gaining skills, increasing their knowledge of and respect for self and others.

As we faced the task of writing curriculum for grade 9, we realized that this effort must provide students with their first in-depth exploration of jobs in a particular cluster. We had also to insure that this experience would be different from the survey of careers experience students had in grades 7 and 8. To this end, we have included the following for each discipline:

1. An "awareness" unit, four to nine weeks in length, through which the student takes another look at himself (his interests, skills and knowledge) and at the subject he is studying in terms of its relevancy to the ten clusters of career opportunities.

2. A "communications" unit, nine to fourteen weeks in length, during which the student has an opportunity to focus again upon what each subject contributes to his acquiring communication skills so necessary for success in each cluster of career opportunities.

3. An "exploration" unit for second semester which provides each student an opportunity to assume a number of the job roles for which a particular subject prepares him.

We have found certain ingredients to be essential to the successful implementation of the survey of careers curriculum and expect these ingredients to be no less essential to the successful implementation of this curriculum. Among these are the following:

1. The need for planning coordination by an interdisciplinary team of teachers and counselors,
2. The need for positive administrative involvement and leadership coupled with increased opportunities for the development of teacher leadership potential,
3. The need for acceptance, nay commitment, on the part of teachers, administrators, and community people,
4. The need for active student participation in the implementation at every step, and
5. The need for flexible scheduling.

Please understand that this represents only a beginning curriculum effort. Materials will be added for a number of disciplines as soon as they become available. We expect also that we will be involved in an on-going process of curriculum development as additional professionals and students become involved, spark new ideas, and identify additional needs.

Awareness and Communication

Units I and II

Art

Preface: Because art is a form of visual communication inspired in part by awareness, the two units, awareness and communication must be taught in one continuing time span with awareness stimulated and immediatley translated into visual communication.

Purposes:

1. To aid the student in gaining an understanding of himself and how he relates to his world.
2. To show the student how to translate self understanding into various art forms.
3. To lead the student to an understanding of how his/her prejudices, attitudes, and goals affect his/her work and success in the world of work.

Objectives: Upon the completion of these units the student should be able to:

1. Assess himself/herself in writing, drawing, painting, and music
2. Determine what kind of job would most appeal to him/her based on this assessment of self - would he/she rather work outside or inside; with people or alone, in an active job or a sedentary one, would he/she rather have to make decisions or follow instructions?
3. Translate ideas from poetry, drama, music, and dance into drawings, paintings, collages, and constructions

Activities: To accomplish the objectives of these units the student may engage in the following activities:

1. Write an autobiography which pinpoints those life experiences which he/she feels have most affected his/her personality.
2. Translate this autobiography into a collage composed of pictures cut from magazines.
3. Translate this autobiography into a symbolic drawing and painting.

4. Upon hearing a group of musical compositions, the student should identify the one composition which most nearly interprets his/her conception of self.

5. Make an abstract color study which illustrates the mood and message of the musical composition which he/she has identified with self.

6. Do a series of symbolic color studies based on such titles as happiness is ...., togetherness is...., sorrow is....., peace is......., success is .....

7. Read short meaningful poems in class (Haiku suggested) and then interpret verbally and artistically.

8. Have dancers visit the class and perform different types of dances (ballet, ethnic, modern, interpretive). Translate the motion and sound into line and color.

Materials:

1. Films on color, lines, symbols and composition
2. Record player
3. Records (rock and roll, musical comedy, jazz, opera etc.)
4. Books of poetry
5. Composition paper
6. Crayons
7. Tempera paint
8. Acrylic paint
9. Water colors
10. Paint brushes
11. Construction paper (different colors)
12. Colored tissue paper
13. Manila paper
14. India ink
15. Pen shafts
16. Pen points (various B widths and pointed)
17. Large number of magazines
18. Scissors
19. Rubber cement & Elmer's glue

Evaluation:

The activities in this unit are all designed so that students will express, creatively, their understanding of themselves, their relationship to the world, and their increased knowledge of various art forms and the world of work. Each activity is, therefore, self-evaluating in terms of the objectives of the unit.

Career Development Curriculum Guide: Grade 9

Unit III - Exploration

Art: Stage Design

Purpose: To lead the student to an understanding of the techniques and materials necessary for good stage design.

Objectives: Upon the completion of this unit the student should be able to:

1. Select colors which are in keeping with the mood of a given play
2. Determine the correct scale for any backdrop design.
3. Design a meaningful backdrop and stage setting for any stage production

Activities: To accomplish the objectives of this unit the student may engage in the following activities:

1. Discuss the meaning and mood of a selected play
2. Design a backdrop which fits the message of the play without detracting from the importance of the actors or the action.
3. Make a miniature stage setting.

Materials:

1. Soft cardboard
2. Poster paint
3. Glue
4. Canvas
5. Sizing
6. Latex paint
7. Brushes

Evaluation:

The miniature stage setting designed and constructed by each student will be used as a means of evaluation.

Career Development Curriculum Guide: Grade 9

Unit III - Exploration

Art: Commercial Design

Purpose:

1. To lead the student to an understanding of the market value of artistic skills
2. To lead the student to a knowledge of how to apply practically the insight and skills he has learned in the first semester.
3. To help the student select the contribution which he can best make based on his understanding of himself.

Objectives: Upon the completion of this unit the student will be able to:

1. Compose advertising slogans which are witty and thought provoking.
2. Select colors which are dynamic and attention getting.
3. Design posters which say graphically the same things the slogans say.
4. Set up an advertising campaign

Activities: To accomplish the objectives of this unit the student may engage in the following activities:

1. Survey popular advertising themes to see how they are carried out in newspapers, magazines, radio, T.V., posters, billboards, bumper stickers, lapel pins. etc.
2. Design poster to publicize a play.
3. Set up an advertising campaign for a play.

Materials:

1. Newspapers
2. Magazines
3. Poster board
4. Brushes
5. Tempera and acrylic paint

Evaluation:

The students' posters and advertising campaign Activities 2 and 3 will be used as a means of evaluation.

Unit III - Exploration

Art: Costume Design

Purpose: To lead the student to an understanding of the sources of inspiration and the techniques of design for stage wear.

Objectives: Upon the completion of this unit the student should be able to:

1. Know where to look for inspiration for costume design.
2. Analyze a stage production as to mood and message and then design appropriate and contributing costumes for the production.

Activities: To accomplish the objectives of this unit the student may engage in the following activities:

1. Visit a library which offers a comprehensive picture collection of the history of fashion.
2. Visit a museum which displays the dress of many lands and periods.
3. Visit the wardrobe department of a theatre.
4. Visit a sewing class to gain an understanding of the motion problems involved in designing costumes and the properties of various materials.
5. Design the costumes for a stage production.

Materials:

1. White water color paper
2. Water color paints
3. Brushes (water color)
4. Pens
5. India ink
6. Fabric samples
7. Resource materials (books, slides, fashion magazines)

Evaluation:

1. Give a short quiz (oral or written) to evaluate student's knowledge of the many places one can look for inspiration for costume design.
2. Use Activity 5 to evaluate Objective 2.

Unit I. Career Awareness

Business

Purpose: To make students aware of the importance of their roles in their socio-economic environment.

Objectives: After completion of this unit, students will:

1. Be able to explain their roles as consumers and producers in their socio-economic environment.
2. Demonstrate that they comprehend the interdependence of business and consumers in our economy by stating specific examples of why this is true.
3. Be able to distinguish between man's basic needs and what he wants.
4. Be able to make economic decisions as to what needs and wants shall be satisfied within their available resources.
5. Be able to describe how individual values influence their participation in their economic environment.
6. Describe how knowledge of our economic system and how it operates contributes to their well-being as members of society.
7. Be able to list specific examples of how the government influences a free economy.
8. Be able to describe how their happiness in life depends on preparing for, obtaining, and enjoying meaningful employment as adults.
9. Explain how their personal qualities lead to their success in living and working with others.
10. Be able to state how they, as individuals, can bring about needed changes that will improve overall living in our society through their knowledge of how our economic system operates.

11. Be able to explain the law of supply and demand and how it affects them as consumers.

12. Be able to define a business transaction and give specific examples of those in which they participate on a daily or weekly basis.

13. Be able to analyze current events that influence them as consumers in their socio-economic environment.

ACTIVITIES

1. Have students compile a glossary of terms related to their study of this unit, including the following:

   money income
   productivity
   producer
   consumer
   real income
   financial security
   consumption
   purchasing power
   standard of living
   free enterprise
   appeals
   pattern of spending
   law of supply and demand
   business transaction
   division of labor
   resources
   values
   assets
   liabilities
   self-image
   alternatives
   individuality

2. Have students research how teenagers spend their money in their community and what influences them to develop and maintain certain spending habits. Use a Teen Buyer's Poll prepared by students with assistance from teacher.

*3. Have students sponsor an assembly for the population of the school with the theme, "You Live in A Business World" or some other appropriate theme which places special emphasis on the role of the student in our economy.

4. Have students plan and sponsor a bazaar to bring reality to the three functions of an economy - production, distribution, and consumption.

5. Have students report daily on current events that affect them as consumers. Examples: pollution, crime, illegal drugs, slow pay phenomenon since inflation, shortage of land, rulings of regulatory agencies, local economic indicator, etc.

6. Have students research the total amount of money teenagers spend in consumer goods and services and compare this amount to the total spending for consumer goods in their economy.

7. Given teacher prepared spending records, have students identify individual values expressed.

8. Have students prepare bulletin boards or other exhibit showing the flow of goods from producers to consumers indicating how the two are interdependent of each other.

9. Have students write essays with teacher prepared themes or student choices with emphasis on do's and don'ts of spending. (Ex. "You in the Marketplace", "Impulse Spending", etc.)

*10. Have students plan, implement, and operate a Student Savings Bank for the school population.

*11. Have students visit business enterprises to try and get discounts for their class or for the general school population on items purchased mainly by teenagers. (Examples - record shops, boutiques, jewelry stores, shoe stores.)

12. Have students view films and filmstrips related to principles being taught in unit.

13. Have students do investigative reports on minority business in the Metropolitan Area with emphasis on minority owned financial institutions.

14. Explain how to write a cloze* and have individual students write one to be used for entire class on the economic topic of their choice.

15. Have students utilize teacher prepared "Business Bingo" featuring terms studied in unit.

16. Have student use a self-inventory form to rate himself as an individual; then let his classmates rate him as they see and relate to him.

* SEE ATTACHMENT

ATTACHMENT

*Cloze = A paragraph in which a pattern of words is left blank, eg., ever 5th word. Students must supply the missing words from their own background of experience or reading; may be used as a review technique.

Ex. The following excerpt from a cloze was used for an advanced group. Simplified clozes may be prepared for students who need that level of difficulty.

Excerpt:

BUSINESS

The well being of our country depends on how well our __________ system operates. As a __________ using goods and services provided by business, you play a very important ________ in the success of business __________ throughout the nation. Basically, our economic system is made up of three parts _________, distribution, and __________. Modern business requires the cooperation of many people.

Business creates ____________ and income for a community. A new business creates jobs for people who will work directly for the firm. This of course provides these workers with ____________ to support themselves and their families. Businesses differ greatly in size and in type of ____________. Business enterprises can be classified according to four plans of ownership: Sole proprietorship, __________, corporation and _______________.

17. Use the games *Raid* and *Consumer* to supplement principles being taught.

*18. Teacher-prepared simulation life experience project: Students will be required to do role-playing in situations and assume that they are adults who must look for employment, find housing, furnish housing facility, buy insurance, purchase automobile, etc.

19. Given a specific amount of money, students will be asked to state how they would spend this amount of money on needs, and on wants.

20. Students will do investigative reports on the regulatory agencies of government.

*21. Teacher-student planned project will involve visiting local business, interviewing businessmen to determine types of ownership, jobs available, and preparation needed for employment with that particular business.

* High impact activities

MATERIALS AND RESOURCES

Multimedia Learning Resources For Consumer Education
Changing Times Education Service
A Division of The Kiplinger Washington Editors, Inc.

Text: *The American Consumer - Issues and Decisions* and workbook Authors: Herbert M. Jelley; Robert O. Herrmann Publisher: Greed Division/McGraw-Hill Book Co.

Teacher Resource: *Values and Teaching* (A professional publication) Authors: Louis E. Raths, Merrill Harmin, Sidney B. Simon Publisher: Charles E. Merrill 1966

Suggested Guidelines for Consumer Education Grades K-12
The President's Committee on Consumer Interests
November 1970 (Can be obtained from GPO)

Tests: Hall Occupational Orientation Inventory (Optional for Grades 7-9)
Authors: Lacy G. Hall, Randolph Tarrier, Dean Shappell

Arlin-Hills Attitude Survey (Grades 1-12)
Authors: Marshall Arlin, David Hills

Available from Scholastic Testing Service, Inc.
480 Meyer Road
Bensenville, Illinois 60106

You Are A Consumer
Authors: Pauline G. Garrett and Edward J. Metzen
Publisher: Ginn and Company

General Business for Everyday Living and Business and You Filmstrip Series
available from McGraw-Hill Book Company

Topics
Institute of Life Insurance and Health Insurance Institute
277 Park Avenue, New York, New York 10017

Methods and Resources for General Business
Authors: DeBrum/Haines/Malsbary/Crabbe/Daughtrey
Southwestern Publishing Company

Total Learning Concept in General Business

Gregg/McGraw Hill

The Balance Sheet
Southwestern Publishing Co.

CHARM - A Career Girl's Guide to Business and Personal Success (Workbook)
Authors: Helen Whitcomb/ Rosalind Lang
Gregg Division McGraw-Hill Book Company

You and Your Occupation
Authors: Beatrice F. Dare and Edward J. Wolfe
Educational Opportunities Division
Follett Educational Corporation

Modern Talking Picture Service (Provides a brochure listing films for loan)
2323 New Hyde Road, New Hyde Park, N. Y. 11040

also Coronet Films
Coronet Bldg. 65 E South Wather Street
Chicago, Illinois 60601

Economics In Our World
Educational Service of The New York Times

USDHEW (Children's Bureau) Some facts and figures about Adolescents

National Dairy Council, Chicago My Reflections (prepared for teenagers)

Games: Raid and Consumer

Evaluation:

1. Students will be asked to do the following, in writing. This may be in the form of a short quiz, a test, or a short essay:

    a. Explain the role of producer and consumer.

    b. Give three examples which explain why business and consumers are interdependent.

    c. From a given list, distinguish between man's basic needs and man's wants.

    d. List five ways that the government influences a free economy.

    e. Explain the term "meaningful employment" and tell how it influences happiness.

    f. List your positive personal qualities and tell how each helps you live and work well with others.

g. Explain the law of supply and demand.

2. Given newspaper clipping of current events, students will explain, orally, how it affects and/or influences them as consumers.

3. Students will be divided into groups of from 2 - 4, and given a prepared situation for role-playing. No dialogue should be prepared; students should simply react as their knowledge, interests, and attitudes dictate. Situations should be planned with Objectives # 4,5,6 and 10 in mind.

Unit I. Career Awareness

Electronics

Purposes:

1. To help students explore the field of electronics to determine if they possess the personal qualities necessary for this area of study
2. To reinforce perviously learned skills and knowledge ncecssary for the continuation of the study of electronics

Objectives: The students should be required to perform the minimum skills and requirements necessary for the completion of the problems in electronics, and upon completion of the unit be able to:

1. Demonstrate the proper safety precautions when given an unsafe situation set up by the teacher.
2. List ten safety precautions to which one should always adhere in order to insure a safe working condition for himself and others.
3. Demonstrate the proper operation of a power source and meter with electronic test equipment.
4. Demonstrate and explain the Law of Charge with a pair of pith balls.
5. Match the schematic symbol with its proper name and unit of measurement from a chart of schematic symbols.
6. Demonstrate that voltage is present when given a zinc and carbon electrode, a jar of electrolyte, a copper conductor, and a vacuum Tube Bolt meter.
7. Develop an operational definition of voltage.

8. Demonstrate the total resistance of a services circuit and determine this resistance using the formula $RT + R1 + R_2 + R_3$

9. Demonstrate their ability to select the right resistor by interpreting its value from the color code found on the resistor.

10. Demonstrate how to obtain the value of the total resistance when given a parallel resistive circuit.

11. Explain orally, and demonstrate mathematically paper, the relationships between current, voltage, and resistance.

12. Demonstrate, with test equipment, how inductive reactance oppose the flow of alternating current using the formula $KL + 2\pi fl$.

13. Explain mathematically how capacitive reactance opposes the flow of alternating current.

14. Display inductive and capacitive reactance cancellation at the reasonant frequency using a dual trace oscilloscope and a resonent circuit.

15. Select one or two occupational areas in electronics, and with the use of the library and other resource areas, complete an occupational research project.

16. List at least nine occupational areas in electronics and the qualifications, training, and personal requirements necessary for each position.

Activities:

1. Set up several unsafe situations in the lab area and have the students to identify these unsafe conditions and correct them in front of the class under teacher supervision.

Have the students list ten precautions one should always adhere to in order to insure a safe working condition for himself and other.

2. Have the students to demonstrate the Law of Charges by showing how unlike charges attract each other and like charges repel each other using a pair of pith balls.

3. a. Have the students check their power source for the correct polarity, and check all of the indicating meters.

   b. Make sure your variable voltage supply will adjust from the minimum voltage to the maximum output rating.

   c. Check all circuit breakers on the power supply to make sure they are not open.

   d. Have the students to demonstrate the proper precautions to use before taking any measurements with meters.

4. Have the students construct a chart of schematic symbols showing the description of the component, letter symbol, graphic symbol, and unit of measurement.

   Pass out a schematic diagram of a circuit and have the students label the different components with their proper names.

5. Have the students construct a voltric cell and explain how it works.

6. a. Give each student an assortment of resistors; have the students to identify their different values by interpreting the color code on each resistor.

   b. Have the students to connect their resistor in series and determine the total resistance of their circuit by using the formula.

7. Have the student exchange resistors with his neighbor and identify the value of each resistor using the color code. This time, students should connect their

resistors in a parallel circuit using as many resistors as the student sees fit. Then each should calculate the total resistance of his circuit using the proper formula for the number and value of the resistors he uses.

$$RT = \frac{1}{R1+R2+R3..;} \qquad \frac{R1\ \ R2}{R1+R2} \quad \frac{R}{N}$$

8. Have the students to form three problem solving groups. Have one group choose a group leader. Let the leader emerge in the second group without making any special designation. Give the third group a designated group leader and a time limit. Have each group solve a circuit problem using Ohm's Law. The groups should report on the procedure they used to solve the circuit problem.

Students should now solve several Ohm's Law problems by writing the correct formula and solution for the unknown formula.

Example:

I = 20 amps; E = 50 Volts; R = ?

$R = \frac{E}{I}$

E = 50 Volts; R = 2.5 ; I = ?

$I = \frac{E}{R}$

I = 20 amps; R = 2.5 ; E = ? E=IxR

9. a. Have students demonstrate the effects of inductance in DC and AC circuit, and the development of counter emfs of self induction at the lab volt experimental units.

   b. Have the students demonstrate that when the DC current has reached a steady value, inductance has no effect on the current flow which is then determined entirely by the resistance in the inductor and the circuit at his lab volt test unit.

   c. Have the students demonstrate the phase angle between voltage and current (which is dependent on the magnitude of reactance) using a dual trace oscilloscope.

      (1) Have the students solve an inductive reactance problem using the formula XL = 2 fl

(2) Have the students solve, on paper, and explain, orally, the difference between "Z = impedence which is measured in ohm's (Ω) and KL inductive reactance which is measured in ohm (Ω).

10. The student can demonstrate how a capacitor conducts alternating current at his test unit. Have the students to demonstrate how varying the voltages across a capacitor causes the capacitor to charge or discharge to new voltage levels and show that the direction of the charge and discharge currents are opposite in polarity.

11. Have the students display the phase angle between the current and the applied voltage on a dual trace oscilloscope and explain orally or on paper how this phase angle depends upon the relative amount of capacitive reactance and resistance in series.

Students should now solve several capacitive reactance problems using the formula $XC = \frac{1}{2\pi fC}$.

12. Have students make a list of at least nine occupational areas in electronics and the requirements, training, and qualifications necessary for each career. Students should compare their own personal qualifications with those on the list to see if they would achieve in that area.

13. Have the students choose one of the nine occupational areas for a research project. If a number of students choose the same occupation, they may work as a group.

Materials:

1. Lab Volt Test Unit
2. Dual Trace Oscilloscope
3. Texts
    a. Learning Experiences In Electricity (workbook)
    b. Exploratory Electricity (workbook)
    c. Electricity and Electronics (Text)

Vocabulary:

1. Induction
2. Capacitance
3. Reactance
4. Impedence
5. Phase Angle

Suggested Filmstrips (Obtain from the Educational Media
Center, D. C. Public Schools)

1. Shop Safety Series

537 "Maintaining a Safe Shop"
682 "Power Supply"
731 "Safety Inspection"
845 "Training for Emergencies"
854 "Treatment for Bleeding and Shock"

2. Modern Geometry Series - Set II

1994 "Vector Geometry"

3. Modern Algebra Series

1972 "Solving Equations"

4. Electricity

210 "Elements of Electrical Circuits"
535 "Magnetism"
750 "Series and Parallel Circuits
782 "Static Electricity"
787 "Storage Battery"

Occupational Areas of Electricity

Drafting

Electronics Equipment Maintenance

Electronic Productions

Laboratory Technicians

Engineering Assistants

Technical Writers and Illustrators

Electronic Equipment Sales: Sales Engineer, Consultants

Professors

Research Scientists

Source:

Gerrish, Howard H.
Electricity and Electronics, p. 304

Evaluation:

1. Evaluate the students ability to perform Objectives # 1,3,4,6,9, and 14 at the time of the activity to which each refers. Students should be expected to demonstrate the process or perform the required skill at a predetermined level of accuracy.

2. Evaluate Objectives # 8, 11, 12, and 13 by having students work problems, either at the board or at their seats. Vary the method of operation to increase speed and efficiency and prevent boredom. (ex. Speed drills, team work, group work, "problem bees", etc.)

3. Have short quizzes which test students ability to do Objectives # 2, 5, and 7.

4. Test Objectives # 15 and 16 with role-playing which should grow out of Activities 12 and 13.

Unit II. Communications

Electronics

Purpose: To acquaint the student with the availability and widespread utilization of facilities for the communication of intelligence over extended distances.

To present and develop an understanding of the principles and techniques employed in modern radio communications.

Objectives:

1. Upon completion of this unit, the student will be able to list orally or on paper three different forms of communicating intelligence.
2. Given a sheet of paper and a pencil, the student should be able to illustrate in block diagram form an Electrical Transmission System.
3. Upon completion of this unit, the student should be able to explain orally or in writing, how sound is produced and transmitted.
4. Given a list of several frequency ranges, the student will be able to select those ranges which are audible to the human ear by circling the correct ranges on a sheet of paper.
5. Given two perpendicular vectors showing amplitude and wave length, the student should be able to construct a sine curve.
6. The student will be able to explain in writing how pickup devices transform sound into electrical energy.
7. Shown the cathoray tube of a television set the student will be able to explain, on paper, how the image signal is picked up and how the image is reproduced on tube.
8. Given a radio, the student should be able to explain how radio waves are transmitted and received.

9. Given the formula $\lambda = \frac{\text{velocity}}{\text{frequency}}$ the student will be able to determine the wave length of a radio wave.

10. Given an oscilloscope and a radio receiver, the student should be able to demonstrate amplitude modulation.

    a. The student should also be able to demonstrate and explain frequency modulation with the use of an oscilloscope.

    b. The student should be able to demonstrate what a carrier wave is with 100% accurary.

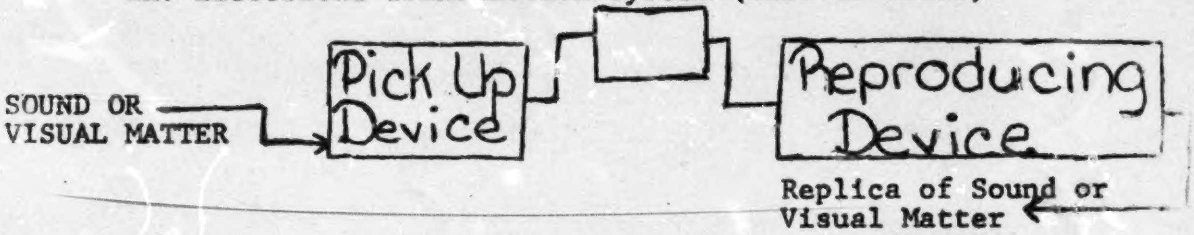
11. The student will be able to construct a block diagram illustrating a total radio communications system.

Activities:

In order to accomplish these objectives, student may:

1. List three forms of communicating on paper or at the black board, e.g. Speech, Music, Visual Information.

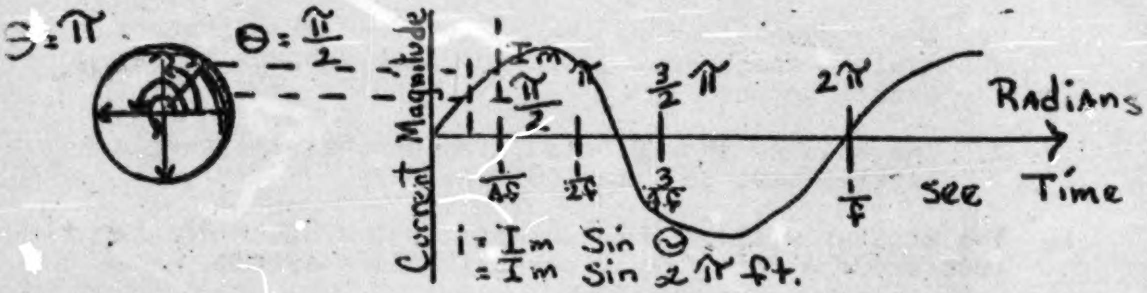
2. Draw a block diagram of an electrical transmission system. Ex. Electrical Transmission System (Wire or Radio)



3. Pluck a rubber band and describe what he saw and heard. Bang two cymbals together and explain how the sound is transmitted.

4. Define the word frequency in electrical terms. With a phonograph and test record, allow the students to listen to several frequency ranges so that they may determine which values are audible to them. Connect an oscilloscope to the speaker of the phonograph in order to display the amplitude of the different frequency reproduction.

5. Construct an A.C. sinusvidual current and voltage sign wave.



6. View a film and sound pickup and reproducing devices.

7. List five pickup and reproducing devices and explain how they operate.

8. Locate the iron diaphragm in a telephone and explain how it changes air pressure or sound into electrical energy.

9. Change light energy into electrical energy with a photo electric cell B High Impact.

10. Take a field trip to WTOP Broadcasting station for information on television transmission.

11. Take a field trip to WHUR radio station with the purpose of obtaining information on radio transmission.

12. Determine the wave length of their favorite radio station using the formula $\lambda = \frac{\text{velocity}}{\text{frequency}}$ $\lambda = \frac{3000{,}000{,}000 \text{ Meters}}{F}$

13. Label the components in a superhytrodine radio receiver.

14. Construct a block diagram illustrating a total radio communication system.

15. Visit the Telephone Company, make a list of related occupations. Let each student choose three occupations and write a job description.

Vocabulary Terms:

1. Frequency
2. Amplitude
3. Transmitting
4. Communication
5. Receiver
6. Field Intensity
7. Wave Length
8. Modulate
9. Oscillator
10. Loran
11. Radar
12. λ = lambda
13. Selective Circuits
14. Meters
15. π = Pie
16. Intelligence
17. Diaphragm
18. Flourescent
19. Intensity
20. Velocity
21. Radio-frequency
22. Carrier
23. Amplifer
24. Antenna
25. Sonar
26. VHF
27. Megacycle = 10^3
28. Kilocycle = 10^6
29. Loud Speaker
30. Microphone
31. Facsimile System
32. Detector
33. Electron Tube
34. UHF
35. SHF

Resources:

Fundamentals of Radio Communications, by Sheingold

Learning Experiences in Electricity, by Howard H. Gerrish

Electricity and Electronics, by Howard H. Gerrish

Evaluation:

Give a unit test, or short quizzes throughout the unit which will require students to complete the objectives with 80% - 100% accuracy. Objectives #8 and #10 may be tested orally.

Electronics

Purposes: To allow the student to obtain actual on-sight information about the employment structure of some electrical or electronic company in order to duplicate those roles in a laboratory situation

To provide the student with a high impact activity that will give him additional concepts of his role in the world of work

Objectives:

1. After visiting the physical plant of one of the electrical companies in his community (communications or manufacturing), the student will be able to develop a block diagram of the employment structure of that company.
2. After choosing a career area and having an in-depth interview with someone in that field, the student should be able to explain orally, and list on paper, the requirements and responsibilities of that position.
3. Upon completion of his research, the student will be able to duplicate his chosen profession in a group project.

Suggested Activities:

1. Have students take a field trip to:
   Telephone Company
   IBM Corporation
   Electric Company
2. Have the student to develop a block diagram of the employment structure of these companies.
3. Have each student choose a career area and have an in-depth interview with someone in his chosen field. Students should report on their interview to the class.
4. Develop a production company in the class allowing each student to duplicate the role of one working in the occupation he has chosen.
5. Have students to choose three research projects that they would be interested in exploring as a class
6. Set up an industrial professional structure in the classroom.
   Have students to devise a mass production program for constructing printed circuit boards - from their conception to the finished product.
7. Plan group discussions on topics such as:
   (a) Where Jobs Are Found
   (b) Getting Started on a New Job
   (c) Getting Ahead in One's Chosen Field
   (d) Careers of the Future

8. Have students design a schematic drawing of a Superheterodyne transistor receiver. After developing a parts cost list, allow each student to construct his radio receiver.

9. Have a group of students develop a research project on Radar Systems.
    a. Students should draw a block diagram of a pulse-type radar system on a flip chart to aid in their class presentation.
    b. Allow students to build a small model demonstrating how the pulse-type radar system operates.
    c. Students can make a list of occupational skills necessary for a career in this field.

10. Repeat Activity #9 for Loran Systems.

Materials for Mass Production Experience:

1. Copper laminated board
2. Paper punch
3. Roll of plastic electrical tape
4. Solution of ferric chloride
5. Photographic Tray
6. Scissors
7. Wax paper

Roles to be Duplicated Include:

1. Management personnel
2. Design and research engineers
3. Testing technician
4. Production engineer
5. Salesmen

Evaluation:

The effectiveness of this unit will be evaluated by observing the degree of success experienced by students during each phase of the role-playing situation.

Unit 1. Career Awareness

English

Purposes:

1. To have the student analyze himself as an individual and see a relationship between how he perceives himself and his performance
2. To increase students' understanding of others and consequently, his ability to deal positively with all types of individuals
3. To determine the students' level of development in the area of mechanical skills

Objectives: Upon completion of the work in this unit, the student should be able to:

1. Define both orally and in writing the following terms:

    a. Personality
    b. Analyze
    c. Evaluate
    d. Introvert
    e. Extrovert
    f. Motivation
    g. Conformist
    h. Non-conformist
    i. Self-concept
    j. Bias

    (Add to this list as the need arises.)

2. Objectively describe, in writing, his personality, looking at such elements as his attitude, interests, goals, and biases.
3. Based on past experiences and analyses of his personality, give an indication, in writing, of what he would expect from this course and how he would use the knowledge and skills gained in future plans.
4. Match a given occupation with personality traits which are usually inherent in that particular job if one is to succeed.
5. Project, in writing, goals that he has set up for himself based on his assessment of his personality and his interests.
6. Show how he has increased his understanding of the reasons behind his own behavior and the behavior of others by:

a. Analyzing the characters in literature (short stories, novels, poetry, etc.) for the purpose of understanding their attitudes, motives, and behavior.

b. Role playing situations which imply specific responses based on projected behavior.

7. Describe some basic techniques which can be used effectively for getting along with all types of individuals.

8. Demonstrate his ability, both orally and in writing, to use the tool of language effectively, varying levels of usage according to the occasion.

Activities: To accomplish these objectives the student may engage in the following activities:

1. Have each student prepare a written analysis of the way he sees himself, and administer to all students the Student Attitude Inventory. A comparison of the information in the student's paper with an interpretation of the inventory results will serve as a basis for preliminary discussion of personality, character, and attitudes.
If used early in the unit:

   a. Keep discussion fairly general; avoid use of any specifics which might identify a particular student.

   b. Begin making on a side board what will become a permanent list of terms. Add to this list throughout the unit. (See Objective #1)

2. Using short stories out of literature texts or periodicals, or popular TV shows, the student will begin a detailed study of character analysis.

   a. Read and discuss two or three short stories that reveal character.

   b. Examine paragraphs of initial characterization in selected short stories. Have students quickly tell several things they note about the characters. List on board. Through a discussion of this list, students should learn how each author reveals character:

      (1) By describing the character's physical appearance

(2) Through the person's actions or general manner

(3) Through other character's reactions - - what they say or think about the character

(4) By what the character himself says or thinks (Note that these are the ways which we use to form our initial impressions of others.)

c. Discuss the three types of characterization - type, individual, and individualized type - using selections from short stories and TV as examples.

d. Using the same stories in b, or different stories where motivation is clearly shown:

(1) Discuss the personality of several characters to see how their attitudes, interests, prejudices, etc. affected their behavior.

(2) Have selected students "become" characters from the stories and react to specific situations as that character would.

e. Using the point of view of another person meeting him for the first time, each student will describe himself using the techniques in b above.

f. Students will write a paragraph using the instructions in d above for a person they have just recently met.

3. In order to help each student begin a more detailed self-analysis, pl[illegible] the following activities:

a. Read and discuss the following poems:
Emily Dickinson, "I'm Nobody"
Mari Evans, "Coventry".

b. Explain metaphor.

c. Discuss the "inner-self" - that which makes each person distinctive from all others. Note how "Coventry" speaks of this secret self that no one else knows completely.

d. Write a metaphor describing the inner self. Example: "I am a balloon, flying wide and free; yet I'm afraid that soon I will hit something sharp and be blown all to pieces."

e. Have the class write one or two metaphors which describe you - the teacher. Use the blackboard and work on these until they are satisfied with the results. (Be prepared for anything!)

f. Have each student write a metaphor which he feels describes him.

g. Read and discuss "Sonnet II" by Gwendolyn B. [illegible] Write a free verse poem or a descriptive paragra[illegible] listing the things you love most. Use concrete images, not abstractions.

4. Have students read and discuss several autobiographical sketches of famous people, for example:

   a. Selections from James Weldon Johnson's Along This Way.

   b. Countee Cullen's "Incident".

5. Have students begin to write their own autobiographical sketches three stages. Portions of Along This Way can be used as example each.

   a. Description of an incident in early childhood which stands out most vividly in your memory.

   b. Description of that point in life when you realized what you wished to make of your life or a descript of some incident which influenced you greatly or m you "leam" toward some particular career.

   c. A projection of your future plans.

6. Have students work in small groups to set up an on-going bulleti board using as headings specific careers which have been mentioned in preceding activities. Under these headings the student will li personality traits or attitudes necessary for one engaged in that career. It should be the responsibility of the students who set u the bulletin board to find suitable pictures and lead the discuss on why these traits fit the particular career under discussion.

7. Have students write a short autobiographical sketch for a prospect employer to attach to their resumes. Limit it to 100 words.

8. Continue the self-analysis phase of the unit through a study of th following:

   a. Human Devices - "Tricks We Play With Ourselves"

a. cont'

(1) Use of excuses - Have a class discussion with examples of rationalization and defense mechanisms.

(2) Escape techniques - Read one or more of the following: "We Real Cool", Gwendolyn Brooks; "The Secret Life of Walter Mitty"; "Esther" by Jean Toomer. Discuss how and why all people use escape techniques or fantasy.

(3) Discuss getting along with others including the futility of "getting even" and the advantage of praise rather than blame.

(4) Practice guessing the motivation behind other's actions through a discussion of the song, "Walk a Mile in My Shoes" and role-playing - "How would you react if ..." (Set up several situations involving from one to three students.)

(5) Have students write an analysis of someone they know. Include exterior behavior and the suspected reasons for such behavior. Possible subjects: salesperson, employer, community leader, teacher, relative, best friend, etc.

(6) Using the bulletin board already set up, discuss how #1,2, and 3 above might affect [illegible]'s ability to do his job. Use both general (any career) and specific (the careers listed).

9. Show how attitudes evidence themselves by having students play a game of charades portraying such attitudes as love, anger, disgust, and interest.

terials:

1. Student Attitude Inventory (Obtain from Career Development where it was used in May 1973)
2. Bulletin board materials - construction paper, letters, yarn, etc.
3. Literature textbooks
4. Periodicals - for stories and/or pictures
5. Reference books - for selections suggested in unit. Include: Black Voices, American Negro Poetry, Along This Way by J.W. Johnson.

6. Record Player

7. Resource material on careers

Evaluation:

1. Give the students a short quiz, oral or written, which tests their understanding of the terms listed under Objective #1.

2. Assign at the beginning of the unit (to be turned in at the end in lieu of a unit test) a folder containing both original and corrected copies of all written assignments and a final written self-analysis based on the material covered. This final analysis should include such things as:

   a. A description of the student

   b. Positive and negative personality traits

   c. His opinion of how these affect his behavior and the behavior of others toward him

   d. His assessment of his ability to perform well in the career he has tentatively selected based on what he has learned about himself

3. As a culminating activity assign teams of not more than four students a situation where it is necessary to:

   a. Use a technique to get along with the other members of the team

   b. Use an escape technique

   c. Use defense mechanisms or rationalization

   d. Behave in a specific manner

   Note how the team responds. Solicit comments as to the "correctness" of the response and alternate suggestions from the class. Have free discussion of motivation and response.

4. Evaluate Objective #8 by observing students' level of usage in class discussions and role-playing situations. Note any improvements made in language usage and mechanics in written work done at the end of the unit.

Unit II. Communications

English

Purposes:

1. To have students recognize the importance of attitudes in job or career situations
2. To realize the importance of both verbal and non-verbal communications and utilize each
3. To recognize the different levels of verbal and written communication and to be able to converse and write on each level

Objectives: Upon completion of the work in this unit, the student should be able to:

1. Distinguish between levels of language usage - colloquial - and standard - and to use the appropriate level when the occasion arises,
2. Write a speech on a newsworthy subject and deliver it before his classmates realizing the purpose of his speech must be specific (to inform, persuade, entertain or rebut and will determine both content and method of delivery.
3. Determine the attitude or mood of an individual after observing a photograph, reading a passage, or listening to a voice.
4. Predict the possible responses of the other party where there is interaction in Objective 3.
5. Complete a job application efficiently.
6. Go into an interview situation exhibiting poise and responding to questions in a detailed manner.
7. Write and dramatize short skits showing how one's response may communicate different ideas to varied groups of people.

8. Prepare a class newspaper showing different methods and levels of communication for the purpose of attracting diverse interest groups.

9. Use both orally and in writing the following terms:

a.	communication	d.	idiolect
b.	language	e.	slang
c.	dialect	f.	colloquial

Activities: To achieve the objectives, the students may engage in the following activities:

1. Compile a list of titles referring to a specific career and classify them according to the usage level, for ex.:

   Physician, Doctor, Medic, Doc, Sawbones

   Which would be considered slang?

   Which is more acceptable in standard and formal use?

   Which is the least respected term?

2. Take a specific subject, for example, sports, and after learning something about it, converse with two different individuals, using slang with one, standard English with the other. Have an observer record the differences in word selection, sentence structure, and body language. Both student and observer should note the reaction and responses of the two individuals. Are there any differences?

3. Either in a notebook or on bulletin board, have students compose a list of slang terms. Beside each term give an interpretation of its meaning. In a third column, give an example of how the slang term may be misconstrued. (This chart may also be done with pictures.) Example:

Slang Term	Interpretation	Misconception
A bad dresser	Exceptionally good; Admirable	Horrible; Sloppy
Mummy	Persons with undesirable attributes	An embalmed human

4. Set up a role-playing situation where the student is involved in a discussion with his employer. Using slang, he explains his views. Observer notes the effects this language has on his employer. He confronts another employer using standard English and effects are observed. Students discuss the two results to determine which is preferable and why. (Use a variety of careers designed to elicit different employer responses. For example, slang might not affect the employer who operates an auto repair shop in the same manner as it might one who operates a ladies specialty shop.)

5. a. Students are given an assignment to write a letter to a public official explaining problems in their neighborhoods and what could be done to rectify them.

   b. When letters are completed, each student exchanges his letter with another student. Their secondary assignment is to underscore any slang terms or examples of non-standard English and suggest alternative ways of stating the same thing.

   c. Have students copy their corrected letters and mail them to the official.

6. a. Play recordings of speeches which inform, persuade, entertain, and rebut. Have students classify according to purpose, listing at least three sentences or phrases which substantiate this classification.

   b. Have students observe speakers in the auditorium, on T.V., in Church, etc., and record points that make the speaker effective. He should watch for such things as voice variation, non-verbal behavior, vocabulary, effectiveness of idea, and use of colloquial expressions of the persons pictured.

   c. Have each student select one of the four purposes and prepare a two-minute speech, first outlining what he intends to say, next writing the speech, then rehearsing at home before a mirror, and finally, delivering the speech before the class.

7. a. Collect a group of photographs. Have students look at a photograph and determine the attitude or mood of the person pictured, then create a situation which might have caused this attitude or expression. This may be written or done through oral discussion in small groups or as a class.

b. Collect a group of photographs and have students write captions based on the expressions of the persons pictured.

c. Assign a short story which emphasizes character. Have students analyze the characters for the purpose of determining their attitudes and discovering what caused their behavior.

d. Listen to records of persons reading poetry, giving speeches, or being interviewed. The student's task will be to determine the mood of the speaker or, in the case of poetry, the mood he intends to create. He is to substantiate his findings with quotes from the recording.

e. Set up the following class activity in creative dramatics:

    (1) A student is shown a photograph
    (2) The attitude of the person pictured is established through discussion
    (3) A situation is created; the selected student is to assume that the person in the photograph is interacting with another. Based on the situation created, short skits are developed for presentation to an audience. No dialogue is given. Students, in acting out situations, respond spontaneously based on the situation, attitudes, and dialogue of other characters.

    (4) Students observing the skit are to record examples of how attitudes affect the responses of others.

f. Have students develop a radio or T.V. commercial. The student should plan his commercial based on the idea that voice quality along with jingles are extremely important in selling a product.

g. Divide the class into small groups. After choosing a subject, the group is to tell a story with a series of photographs. (Students take their own photographs.) Captions may be placed on the backs of photographs. Pictures will tell the story; group members will make up both captions and stories - Example: Subject: Basketball game. Record reactions of a small group of fans on the winning side.

8. a. Have students practice filling out job applications collected from various metropolitan agencies. Through discussion, students will become familar with the terms used on applications and the meanings and interpretations of questions asked.

   b. Students, having filled out job applications, are to pass them to other class members for the purpose of critically analyzing responses (word choice, sentence structure, thoroughness, rambling, etc.)

   c. Have students select five careers and design job application forms that would be applicable to each of those careers.

   d. Give students an outline for writing a resume. Have each student to write a resume of himself then choose a career, and, based on the background needed for that job, write a fictitious resume.

   e. Collect and discuss job advertisements and civil service forms, paying close attention to the language used and any abreviations.

9. a. Have students draft a letter to be sent to several government agencies, the telephone company, and PEPCO inviting a member of their personnel departments to come to the school and participate in a panel discussion on the subject of job interviews. Panel members will be asked to discuss such topics as:

      (1) The types of people employees are looking for
      (2) The questions asked during an interview
      (3) How the attitudes of those interviewed affects the interviewer
      (4) Good interview techniques
      (5) Any questions students may have

   b. Have each student select a specific job and set up a series of interview questions based on this job.

   c. Create an office situation in the classroom and conduct mock interview sessions based on the questions from activity b.

   d. Work in conjunction with newspaper and yearbook staff for the purpose of conducting real interviews with students interested in joining these staffs.

e. Send a committee of students to make a prearranged visit to a personnel office. Students should observe potential employee's dress, hairstyles, and mannerisms, and ask prepared questions of the office personnel.

f. Select several students who are interested in real employment to visit personnel offices for interviews. Students should utilize the techniques learned so far.

10. a. Play a game of charades where students are to dramatize words or phrases to show how ideas can be transmitted without words.

b. Divide students into groups. Have each group put on a skit using no words in order to show and better understand how ideas and attitudes are conveyed without the use of language. The title of each skit should be placed on the board before the skit is performed.

c. Have students compile a list of double-barreled words or slang expressions and show how they can mean different things to various groups of people.

d. Have the class develop a skit where slang is used a great deal. Invite a small group of adults in. After the skit, question the audience on any problems they may have had interpreting meaning, and the ways body language helped to abbreviate language barriers.

Materials:

1. Newspapers
2. Magazines
3. Cameras; film
4. Typewriters
5. Job applications
6. Textbook
7. Civil Service job ads
8. Records; Record Player
9. Newsprint

Tie-in with Other Areas:

1. Art
2. Journalism
3. Dramatics
4. Speech

Related Careers:

1. Writer
2. Actor
3. Journalist
4. Lay-out Man
5. Typist
6. Printer
7. Announcer

Evaluation:

Produce a class newspaper or magazine. At some point in the process from selecting the staff to the finished product, students will be involved in each of the specific behavioral objectives listed.

1. Students will apply for the position of:

   Managing Editor
   Advertising Manager
   Editor
   Reporter
   Feature Writer
   Sports Writer
   Typist
   Cartoonist
   Proof-reader
   Lay-out Man
   Distributor
   Sales Manager

2. Job applications should be filled out and resumés written.

3. Each student should be interviewed for the job in which he is most interested.

4. Advertising and sales personnel should prepare displays, written copy, and short speeches (to be delivered in individual homerooms, in auditorium, cafeteria, and over PA system) designed to sell the product to the whole school.

5. Written copy should utilize appropriate levels of language usage. Example: Slang or colloquial English used in a sports story might not be used in an editorial.

6. Each member of the class will assume some role or roles on the newspaper staff and help produce at least two issues.

Unit III. Exploration

English:

Purpose: To promote a realization of the various job opportunities directly related to the subject of English and of the necessity of a command of the language in each career.

Objectives: Upon completion of this unit the student should be able to:

1. Demonstrate marked improvement in the application of basic spelling rules
2. Demonstrate mastery of basic language usage:
    - (a) Subject-verb agreement
    - (b) Pronoun case
    - (c) Modification - forms and placement
    - (d) Verb tense
    - (e) Agreement of pronoun with antecedent
3. Apply basic cataloguing and filing techniques
4. Display his own talents in various forms of media communication
5. Review (Evaluate) and edit given material - both visual and oral
6. Demonstrate improvement in reading comprehension and vocabulary

Activities: To accomplish these objectives the students may engage in the following activities:

1. Diagnostic Pretesting
    - a. Administer spelling pretest - Dolch's list for junior high school mastery - 100 Spelling Demons
    - b. Teacher devised spelling test to determine student skill in applying the following spelling rules:
        - (1) ie/ei rule
        - (2) Addition of suffixes
        - (3) Plurals of nouns
        - (4) Possessive forms
    - c. Published or teacher devised usage test. (See Objective 2)
    - d. Written evaluation by each student of a TV show, newspaper, or magazine article
    - e. Proof-reading - Use copies of any piece of written work with errors for students to edit.

The monotony of continued testing could be varied by bi-weekly discussions of careers related to English. Student contributions of ideas might then be organized into the four areas which follow.

2. Office Management Careers
   a. Clerical:
      (1) Distribute 20 cards to each student. Instruct students to make up a different name, address - with zip code , phone number, occupation, age, and sex for each card. Give model at board -
      (2) When students have completed this task, have them place a rubber band around their cards. Collect card packs, distributing each to another student.
      (3) In subsequent days run a contest for 5 - 10 minutes daily, first for alphabetizing, then for sorting by each of the other categories: zip-code, male/female count, etc. The winner will be the student who completes the assignment first without error.
      (4) When each contest is completed, students should exchange and correct each others' work, the teacher remaining attentive to identify and give help to those who have difficulties with such tasks
      (5) Engage in similar activities at three-week intervals

   b. Dictation
      (1) Dictate weekly, four to five sentences, each set containing spelling demons and a number of words exemplifying one of the following rules:
         (a) i before e rule
         (b) Adding suffixes: doubling the final consonant, retaining or dropping silent e
         (c) Plurals of nouns
         (d) Possessive of nouns
         (e) Basic capitalization
      (2) Retest of same sentences should be given two or three days later with brief daily drill in applying the rule to be emphasized. Such practice should continue throughout most of the semester, since some of the above rules will require a number of different sessions.

   c. Telephone Manners - Practice with business calls of all types: greetings, taking messages, collection, etc.

   d. Vocabulary - Dictionary Skills - Pose each assignment as a job challenge, for example:
         1. Mystery Words - Have students

locate unfamiliar words (given orally) in the dictionary ("Your boss dictates a letter containing a word you do not know. What will you do?")

2. Division of words into syllables (Phonics review)
3. Practice in locating synonyms and antonyms in dictionary ("Choose a better word for ____________")

e. Business letters
   - (1) Review correct business letter and content form by having students choose partners. Each student plays "boss" and dictates his letter to his partner. Students should then go over both letters together to improve their content
   - (2) Write the letter in good form, address envelope, and fold letter correctly. (Note: this step requires 2-5 tries for most students.)

3. Library Science

a. Plan field trips to the school library, Martin Luther King Library, and Library of Congress. Each visit should have a distinct point of reference and/or predetermined purpose, for example;
   - (1) Various library careers
   - (2) Cataloguing procedures
   - (3) A study of displays
   - (4) Programs and community services
   - (5) Care of hard and soft ware

b. "Be a Book Detective" - Student practice in the use of library resources
Method: Distribute ditto of "Mysteries" to be solved. Phrase questions in the following manner:
   - (1) Where would one find a book about________?
   - (2) What would be the catalogue number of____?
   - (3) How many types of references, other than books, can you find on the subject of____?

c. Individual projects -- Students may work individually or in small groups on one of the following types of projects:
   - (1) Prepare a book list (title and brief description of each) for 9-11 year olds.
   - (2) Prepare a list of books for one who is seeking background information on a particular career area (writer, librarian,

editor, journalist, etc.)
(3) Prepare and present a program designed to interest young children in reading. Include oral reading of a story or stories.
(4) Act the part of a lawyer's assistant, locating and listing all available, material on a given subject (art thefts, zoning regulations, etc.)
(5) Design and present a program to increase community interest in, and knowledge of one of the following:
   (a) Variety of library services availab
   (b) Gardening and landscaping
   (c) Co-operation child care and pre-school education
   (d) Pre-natal and infant care
   (e) Programs for youth

d. Book Review - Have each student to select and read one book from a given list and write a review which includes such information as:
   (1) General content
   (2) Age-level or group for which it is recommended
   (3) Author's skill in handling subject

4. Sales and Promotion (4 weeks)
   a. Plan field-trips to various agencies such as:
      (1) Public Relations Office
      (2) Department store
      (3) Advertising agency
   b. During the field trip, students should take notes on methods used to sell and/or promote products. (Pre-trip discussion should elicit a list of standard propaganda devices and methods of appeal with examples of each.
   c. Have students make a collage or booklet of newspaper and magazine ads, labeling the propaganda device used in each.
   d. Using the best of the propaganda devices discussed in b above, each student should "invent" a product and write promotion and advertising slogans and script for it.
   e. Design a newspaper ad for a sale at a local department store.
   f. Prepare a public relations campaign for an entertainer or local politician.
   Outline activities and agenda, write promotion and script for radio and T.V. spots

5. Journalism (5 weeks)
   a. Introductory unit on basic journalism techniques should be done first

b. Have students engage in the writing of news accounts, editorials, human interest stories, and book reviews

c. Interview a local celebrity, politician, community leader, or school leader and write an article on that person. (May be either straight news or human interest)

d. Write short poems and descriptions

e. Write the material for, and role-play various types of TV performances such as:
(Use video-tape, if available)
    (1) News reporting
    (2) The "Talk Show"
    (3) Interview
    (4) Documentary

f. Produce one issue of a newspaper and/or a magazine of critical and creatvie writing. (This may be a continuation of an activity in the Communication Unit, or may be a new activity for Exploration.)

Evaluation: Administer the same battery of tests described in Activity 1.

Materials:

1. Dolch Spelling Test
2. Twenty packages of 3x5 cards and forty rubber bands
3. Dictionary for each student
4. Teletrainer from C & P Telephone Co. or Telephone sets
5. Newspapers and magazines
6. Tape recorder
7. Video-Tape machine
8. Materials for duplication of student publication

Unit I. Awareness

Graphic Communications - "What is Graphic Communications?"

Purpose: To show that communications power is a tool for learning.

Objectives: Upon completion of the work in this unit, the student should be able to:

1. Identify early attempts at communications.
2. Discuss the invention of the alphabet and the introduction of movable type.
3. Discuss shop safety and shop management.
4. Discuss lithography as a tool of mass communication.
5. Identify the computer as a tool in mass communication.

Activities: To accomplish these objectives, the student may engage in such activities as:

1. Viewing the AB-Dick film, "Graphic Communications: They Used to Call It Printing".
2. Writing and publishing a report on "The Brief History of Printing".
3. Reading and discussing Chapter I, Graphic Arts, Carlsen.
4. Writing shop safety rules on clear write-on transparencies, in shop notebook, or on direct image master for reproduction on the offset press.
5. Writing a short paper on "Use of Lithography Today" describing its use in mass communications.
6. Making a flow chart showing use of computers in mass communications.

Materials: Clear transparencies, Laps, overhead projector, direct image offset plates.

Notes: Tie-in with other subject areas: ALL.

Vocabulary: Computer, relief printing, Intaglo, gravure, stencil, mimeograph, silkscreen, bookbinding, photography.

Evaluation: Most activities are self-evaluating; student's ability to fulfill the most objectives of the unit will be assessed through class discussions.

Unit II. Communications

Graphic Communication - "Mankind: The Communicator"

Purpose: To show that mankind because of his mind(brain) is able to think orginally and create communications symbols of one's own design.

Objectives:

Upon completion of the work in this unit, the student should be able to:

1. Identify twelve symbols used in communications.
2. Name the tools used in the process of learning to communicate.
3. Write the results of the process of learning to communicate.
4. Identify the product of the process of learning to communicate.

Activities: To accomplish the objectives, the student may engage in activities such as:

1. Play the"Name Game" using the following symbols in communicating: Words, photographs, objects, signs, diagrams, colors, drawings, abstract figures, cartoons, handwriting, silhouettes, charts, graphs, numbers, maps, and flags.
2. Write the five senses in notebook and/or write on transparencies for use on the overhead projector.
3. Make a flow chart showing a process of learning to communicate or make use of write-on transparencies.
4. Write Career descriptions.

Materials: Clear Transparencies, Overhead projector, Laps and student folders.

Note: Tie-in with other Subject Areas- All

Career Opportunities: Mathematician, Scientist, Teacher, Artist, Photographer, Cartoonist, Writer, Designer, etc.

Vocabulary: diagram, abstract, silhouette, communicate, perceive, conclude, color.

Evaluation:

All four objectives can be evaluated through the use of a test or a series of short quizzes - either oral or written.

Unit II. Communications

Graphic Communications - "Man: The Producer"

Purpose: To show that mankind uses communications to create products.

Objectives: Upon the completion of the work in this unit, the student should be able to:

1. Use symbols of communications to make a product.
2. Discuss how communications production is changing rapidly.
3. Explain how mankind visualizes and conceptualizes ideas to create a product.

Activities: To accomplish these objectives, the student may engage in such activities as:

1. Make use of communications symbols to create, on an offset direct image plate, a product in communications.
2. Make a flow chart showling how graphic communications have changed.
3. Illustrate an idea on scratch paper. Create (imagine) a design for an auto, a book, building, bicycle, house, boat or a printed sheet. Transfer these ideas to descriptive drawings, informal drawings or photograp Make use of direct image plates and camera. Think this formula: Skills & Idea carrier = Product
4. Write career descriptions.

Materials: Transparencies, overhead projector, Laps

Notes: Tie-in with other Subject Areas: ALL

Career Opportunities: Mathematician, Teacher, Scientist, Offset Pressm Plate Maker, Designer, Architect

Vocabulary: idea, create, compute, input, out-put, concept, illustrate and product.

Evaluation:

Use the assigned activities as a means of evaluating students in terms of the stated objectives. Each student should "create" a product and explain it to the class - from idea to the scratch paper design.

Graphic Communications - "Mankind: The User"

Purpose: To show that man the communicator, produces and then uses communications for betterment of self and society.

Objectives:

Upon completion of the work in this unit, the student should be able to:

1. Describe how man accepts or gears change.
2. Discuss the continuing process of man's development.
3. Discuss man's basic needs.
4. Describe the materials needed in the process of learning to communicate.

Activities: To accomplish these objectives, the student may engage in such activities as:

1. Write a description of your/his experience on an airplane.
   - a. Write a description of the effect of changing from dial to push button telephone.
   - b. Write a description of his first trip on a sub-way train.
   - c. Write a description of how he felt when man travelled in space, or to the moon.
   - d. Write a description of the joy of discovery. (Learning)
2. Use communications symbols of one's choice to show mankind's development at home, in the community, country and the world.
3. Make posters or collages which show mankind's basic needs: security, love, belonging, achieving, appreciation, recognition, performance and learning.
4. Collect and demonstrate materials needed at different levels of experience in learning to communicate.

Input: (Symbols and worlds, exhibits, demonstrations, sounds and pictures, field trips, direct involvement.)

Output:
or (Working, creating, living, playing, relating.)
Action:

5. Write career descriptions.

Materials: LAPS, folders, transparencies, overhead projector.
Note: Tie-in with other subject areas: ALL
Career Opportunities: Pilot, Metro Worker, Telephone Communications, Space Scientist, Computer Programmer.
Vocabulary: insight, input, output, perform, achieve, appreciate and recognition.

Evaluation:
1. Objective 1 can be evaluated through open class discussion, or small group discussion.
2. Objectives 2, 3, and 4 are self-evaluating.

Unit II. Communications

Graphic Communications - "Mankind: The Humanitarian"

Purpose: To show that mankind, the human being, uses social powers to transmit ideas.

Objectives: Upon the completion of the work in this unit, the student should be able to:

1. Describe a person's needs as a member of a social group.
2. Describe a person's needs an an individual.
3. Describe a person's needs as an effective, participating citizen.
4. Describe a person's needs as an active, participating worker.

Activities: To accomplish these objectives, the student may engage in such activities as:

1. Have an informal debate or class discussion on why man needs to belong and function in a group.
2. Using direct image plate, describe the limitations set by society. Use transparencies to describe mankind's concern for other people's needs.
3. Write or type on direct image plate a paragraph on "Identification of Self". (Look in a mirror and ask yourself, who am I?)
4. Describe, orally or in writing, the limitations set by self.
5. Use "Games" describing passive and active roles.
6. Play "Games" describing passive and active roles.
7. Have students role-play various jobs showing both performance requirements and limitations.
8. Have students write descriptions of processes and equipment availability (in Graphic Arts Labs, etc.)
9. Have students research one of the careers listed below and show the results of their research through art work, dramatizations, oral reports, etc.

Materials: Graphic Arts supplies and related materials.

Career Opoortunities: Writer, Economist, Psychologist, Sociologist, Minister, Teacher, Perhaps all job descriptions.

Vocabulary: economics, psychology, sociology, technology

Evaluation: As a culminating activity, have students participate in a formal debate on the resolution,

Resolved: Mankind must live in a society of some kind.

Students can use the knowledge gained through the assigned activities as supportive material. There will usually be a few students who feel that mankind can exist alone, let these take the negative side. If all students agree, then instead of a debate have a round-table discussion or a symposium.

Unit III - Exploration

Multi-graphic Communciations

Purpose: To introduce exploratory graphic communications through newspaper workshop

Objectives: Upon completion of the work in this unit, the student should be able to:

1. Discuss the mechanics of newspaper journalism.
2. Organize a school newspaper office.
3. Publish a school newspaper.
4. Make layouts, paste-up, hand-set type, and make off-set plates.
5. Operate the A.B. Dick off-set press.
6. Discuss modern methods of newspaper publication.
7. Discuss collective bargaining.

Activities:

1. Read Journalism, by Hartman.
2. Define the following terms using Journalism, and the Dictionary of Technical Terms, by Crispin: censorship, format, free press.
3. Write a brief history of the newspaper.
4. Make a flow chart showing the organization of a school newspaper office.
5. Select and research the job, and "role play" Editor, Managing Editor, Proofreader, Estimator, Sports Editor, Art Editor, Lay-out Man, Editorial Writer, Platemaker, Advertising Manager, Pressman, and Publisher of a newspaper.
6. Write, layout, make a plate, and publish a one or two page newspaper.
7. Using A.B. Dick Manual of Instructions, operate the A.B. Dick 3[illegible] Offset Press.
8. Select and write six career descriptions from the SRA Kit.
9. Write a research paper on "Use of Computers in Newspaper Publication".
10. Form a Union and participate on a labor/management team to negotiate a union contract.
11. Watch color slides on collective bargaining.

Materials:

1. Journalism, Hartman. Dictionary of Technical Terms, Crispin. Press Time, Adams and Stratton
2. Paper or transparency for flow chart.
3. SRA Career Description Kit
4. A.B. Dick Curriculum Guide and booklets.
5. Slide projector.
6. Overhead projector.
7. A.B. Dick Instruction Manuals.
8. A.B. Dick direct image and pre-sensitised plates.

9. Chemicals and other materials needed for plate making.

Notes: Tie-in with other subjects areas.

Language Arts: All Activities
Math: Activities 4, 6, 9
Science: Activities 6, 7, 9
Social Studies: Activities 1, 3, 10

Career Opportunities: See Activity #5.

Technical Terms: See Jargon of Journalism at the end of each chapter and in the Glossary of Journalism, Hartman.

Evaluation:

Use the newspaper produced by the class as a means of evaluation.

Lesson: Newspaper Workshop

Performance Objective:

Given a textbook, Journalism, by Hartman, mini-lecture demonstrations, his choice of a role to play, A.B. Dick Graphic Communications materials, layout paper, direct image masters, A B Dick Manual of Instructions, offset press, letter press and related materials, the student will be able to write, layout, and publish a one or two page newspaper with 80% accuracy.

Instructional Procedure: Teacher led mini-lectures and demonstrations.

Student Learning Activities:

1. Read Journalism, Hartman. Write the definition of all terms listed under "Jargon of Journalism" at the beginning of each chapter.
2. Do all assignments at the end of each chapter.
3. Make a flow chart showing the organization of a school newspaper.
4. Select a role you would like to play in the organization of our career development newspaper company. (Editor, Publisher, Printer, e
5. Organize a school newspaper office.
6. Select and use materials from A B Dick Graphic Communications as they apply to your selected role. (Layout, art work, etc,)
7. According to your selection of role, write an article for the CD Newspaper.
8. Read A B Dick Operating Manual. (Be prepared to name parts of press)
9. Make direct image or metal plate for CD Newspaper.
10. Publish CD Newspaper.
11. Form a union and select a negotiating team from labor/management an

write a labor contract.

12. Write a research paper on "Use of Computers in Newspaper Publication."
13. Select and write six career descriptions from the SRA Kit. (editor, estimator, proofreader, layout, stripper, cameraman, pressman, advertising man, platemaker, publisher.)

Quest: Tour and write a description of one phase of operation of the Washington Post and the Washington Star-News.

Arrange a visit by Richard Prince, an Education Journalist with the Post.

EVALUATION: PRE TEST - POST TEST

NEWSPAPER WORKSHOP

DIRECTIONS: Each of the following statements or questions is followed by a set of words or phrases. Choose the one which answers the question or phrase correctly. Place the letter of the correct answer in the box beside the numeral.

1. The function of a newspaper is to:
    a. inform
    b. interpret
    c. entertain
    d. a, b, and c above
2. The main contents of a newspaper are:
    a. news columns, special page news, editorials, advertisements
    b. cartoons, crosswords, comics
    c. sports, births & deaths, weather
3. The guiding influence of a newspaper is its:
    a. editor
    b. business manager
    c. publisher
4. The Managing Editor has three principal assistants
    a. foreign, national, and city editors
    b. sports, special, and feature editors
    c. reporters, photographers, society editor
5. Responsible journalism shows:
    a. courage
    b. balanced coverage
    c. a, b, & c, above
6. A responsible journalist will write only about:
    a. factual news
    b. insignificant news
7. The opening paragraph of news story is called a:
    a. body
    b. top
    c. lead
8. The elements of a summary lead are:
    a. who, what, where, when, why and how
    b. who, what, when, where
    c. who, what, when
9. A news story is told three times:
    a. in the lead paragraph, in the middle paragraph, and in the last paragraph.
    b. in the headline, lead paragraph and the body.
10. In the lead and in the body, the facts are arranged in order of importance. This arrangement is called:
    a. the pyramid
    b. the inverted pyramid
11. The main duty of the copyreader is to:
    a. shape reporter's copy into readable stories
    b. see that deliveries are made on time
    c. rewrite copy

EVALUATION: PRE TEST - POST TEST
NEWSPAPER WORKSHOP (cont)

12. The main task of the proofreader is to:
    a. compare original copy with galley proof and note mistakes made by printers
    b. rewrite copy
    c. make galley corrections
13. A good headline has these main purposes:
    a. advertise, summarize, relate, and attract
    b. excite, sell, compete
14. In designing the page, you must first sketch a:
    a. lay-out
    b. dummy
15. Photo-offset lithography is a method of image transfer. It is usually referred to as:
    a. litho
    b. offset
    c. graphic
16. The principle of offset lithography image transfer is one of:
    a. physics
    b. mechanics
    c. law
    d. chemistry
17. Offset image transfer is done from a surface that is:
    a. flat
    b. round
    c. curved
18. On a direct image plate you must use a special pen or pencil.
    a. yes
    b. no
19. The five basic systems of offset lithography are:
    a. feed, water, ink, impression, and delivery
    b. feed, water, ink, impression, and transfer
20. The principle of offset lithography is:
    a. water and ink will mix
    b. water and ink will not mix

Home Economics

Unit: You Are the Foods You Eat

Purposes :

1. To guide students in developing healthy attitudes towards themselves as well as others
2. To aid students in discovering their own preferences and dislikes regarding foods needed for good nutrition
3. To help students recognize the effects of good and poor nutrition on teenagers
4. To make students aware of the importance of good nutrition to their physical, emotional, social, and mental development and to see how this development, by affecting their outlook and reactions helps them to become the distinct individuals they are
5. To make students aware of the various areas which home economics covers and its relationship to the total individual and one's home as well as the world of work.

Objectives: Upon completion of this unit, students will be able to:

1. Identify and list foods needed for good health
2. Research and make correlations between good nutrition and good mental health.
3. List dislikes and preferences for food and suggest ways to improve food habits.
4. Discuss the relationship between foods and attitudes about self, towards others, home, school, and the world of work.
5. Recognize and list some of the outstanding personality traits and abilities of themselves and others.
6. List their strengths and suggest ways to improve upon their weaknesses.
7. Discuss and illustrate the relationship between home economics, the home, and the world of work.
8. Discuss some of his job preferences as they relate to skills and knowledge gained in foods experiences in home economics
9. Express, orally, how one feels about himself when performing certain jobs in foods careers
10. Identify, in three written statements, what attitudes one has for work which must be done in jobs in food careers. (These statements will be based on various entry levels).

Activities: In order to accomplish these objectives students may engage in such activities as:

1. Making a nutrition ladder showing the nutrients,

their functions, and the foods which provide them.

2. Filling out a personality inventory and job preference questionaire which will tie in with the foods unit in communications.
3. Researching particular job areas and listing attitudes and/or personality traits which correlate according to the job inventories.
4. Listing those personality traits which would be desirable and those which would be undersirable for a given job.
5. Role playing desirable and undesirable personality traits in specific job situations and discussing how each would affect job performance, work habits, fellow employees, etc.
6. Demonstrating how to solve a given set of problems concerning attitudes about self or a work situation through role playing.
7. Making pictoral charts to illustrate the physical signs of good nutrition, adequate, well balanced family meals, or the basic food needs of the family.
8. Making a chart which shows the relationship between home economics, fealings of self-worth, and the ability to get and hold a job
9. Bringing in slides, snapshots, pictures from magazines, etc, of events which show foods as a social experience, wise food choices, ways of using food, or foods related experiences in the wise use of leisure time.
10. Making a video tape of students' job related food projects-emulating Julia Childs or the Galloping Gourmet.
11. Collecting and displaying classified ads for jobs related to foods.
12. Making a bulletin board display using title "You Can Score with Good Nutrition".

Materials:

1. Books:

   a. Occupational Outlook Handbook
   b. McDermott. Opportunities In Clothing
   c. Reiff. Steps in Home Living
   d. "Washington Post"
   e. "Occupational Information in the Junior High School" from Prevocational Orientation in vocational Education for Junior High School Students in N. M. by De Blassie and Jones; Research Coordinating Unit, Vocational Division, Dept. of Education, Santa Fe, New Mexico.
   f. Teen Guide to Homemaking, J. C. Penny, (Silver Spring Store)

2. **Films:**

"Job For You: It's Happening In Home Economics" by Guidance Associates of Pleasantsville, New York.

Evaluation:

1. Have each student plan a well balanced diet for himself based on his ability to complete Objectives # 1 and 3.
2. From a given chart, have students select those food careers for which one would be suited based upon one's personality - attitudes, strengths, weaknesses, etc. Students should be able to justify and support their choices.
3. Evaluate other objectives through open class discussions.

Unit I Awareness

Home Economics:

Unit: We Become Aware of Ourselves and Home Economics

Purposes:

1. To guide students toward developing healthy attitudes toward themselves as well as others and to aid them in discovering their true personalities.
2. To make students aware of the various areas which home economics covers and its relationship to the total individual and one's home as well as the world of work.

Objectives: Upon completion of this unit the student will be able to:

1. Recognize and list some of the outstanding personality traits and abilities of themselves and others.
2. List strengths and suggest ways to improve upon weaknesses.
3. Discuss and illustrate the relationship between home economics, the home, and the world of work.
4. Discuss some of his job preferences as they relate to one's capsule personality.

Activities: In order to accomplish these objectives, students may engage in such activities as the following:

1. Completing a personality inventory and a job preference questionnaire. (Tie in with other disciplines).
2. Doing research on particular job areas which their personality and job inventories suggested that they might like.
3. Listing some personality traits which would be desirable for a given set of jobs.
4. Acting out desirable and undesirable personality traits exhibited in given situations.
5. Demonstrating how to solve a given set of family problems through role playing.
6. Cutting pictures out of magazines to illustrate the physical and emotional needs of all individuals.
7. Sharing products of their own creativity with other members of the class.

8. Making charts which show the relationship between Home Economics, the home and the world of work.
9. Bringing in slides, snaphsots, etc., of an event which they enjoyed with their families and friends to share in class. Tell why you enjoyed that particular event or the persons involved.
10. Making a video-tape of a student's project (self-expression or home economics - related job).
11. Collecting and displaying classified ads for jobs related to Home Economics.

Materials:

1. Books

   a. Occupational Outlook Handbook
   b. McDermott, Opportunities in Clothing
   c. Reiff, Steps in Home Living.
   d. "Washington Post"

2. Films. Filmstrips. Cassetts:

   "Job For You". "It's Happening in Home Economics" by Guidance Associates of Pleasantsville, New York.

Vocabulary:

1. Personality
2. Characteristics
3. Respect
4. Traits
5. Individual
6. Emotional
7. Physical
8. Environment
9. Attitudes

Evaluation:

Have each student select a career in the Home Economics field and assess one's suitability for this job. This will require students to use the information about themselves and their personalities gained through a completion of the activities and will test the objectives of the unit.

Unit II Communications

Home Economics

Unit: Your Dress and Grooming: A Means of Non-Verbal Communication

Purpose: To make students aware of the importance of dress and grooming in developing poise and self-confidence and in affecting the attitudes of others.

Objectives:

Upon completion of this unit, the student will be able to:

1. Recognize the relationship between poise and self confidence and the success of an individual.
2. Illustrate the importance of dress and grooming in affecting attitudes of others towards an individual.
3. Show that clothing is a means of communicating.
4. Define "poise" and "self-confidence".
5. Demonstrate the importance of being well-groomed.
6. Demonstrate and tell how one feels about himself and others.
7. Show that one's poise and self-confidence have increased.
8. Choose clothing which is becoming to the individual's complexion and body build.

Activities:

To accomplish these objectives, the student may engage in activities such as:

1. Defining the following terms:
   a. grooming
   b. poise
   c. communication
   d. appearance
   e. attitudes
   f. success
   g. self-confidence
   h. manicure
   i. dermatologist
   j. pedicure
   k. completion
2. List the characteristics of a well-poised individual.
3. Take snapshots (entire body) of each other in class and develop the pictures. Analyze your photograph and list those characteristics which need improving (Ex. A more becoming hairstyle might be needed.)
4. Inviting a barber or beautician to class to demonstrate the care of the hair and how to choose becoming and attractive hairstyles.
5. Inviting a person from the world of business to talk to the class on the importance of personal appearance in securing jobs.
6. Listing those characteristics which indicate a well-groomed individual.

7. Make a cleansing cream or shampoo using natural foods (Ex. Cucumber and sour cream for cleansing creams).
8. Have a beautician give a demonstration on manicuring and provide students with the opportunity to give each other a manicure.
9. Write a report on some other culture telling how they used dress as a means of communicating ideas.
10. Using a stain and odor removing chart, try out the ways of removing stains and odors in soiled clothing.
11. Tour modeling school or agency to observe poise and clothing of the models (male and female).
12. Using sample necklines, (v, crew, round, etc.), decide which necklines are becoming to you by viewing yourself in a full length mirror.
13. Analyze your figure or physique to determine your body type.
14. Make a list and collect pictures of clothing styles which are becoming to your body type.
15. Using large fabric samples of various colors (shade and tints), hold each one next to your face while looking in a mirror to determine which colors are more becoming to you.
16. Write a brief report and demonstrate the care of the body using a videotape machine if one is available.
17. After having been shown a given set of individuals in various types of dress, each student is to list descriptive words which illustrate one's impressions of each individual and of his dress.
18. Take exercises to improve posture.
19. Discuss the role which one's diet plays in being well-groomed and healthy.
20. View films and filmstrips on grooming activities.

Materials:

Books and Pamphlets:
1) Drury, Michael How To Develop Poise and Self-Confidence (The Amy Vanderbilt & Success Program for Women), 1969
2) Reif, Steps In Home Living
3) Gawne, Dress, 1969
4) Strum, Teen Guide To Homemaking

Films Filmstrips:
1) "Color" 1969, 10 min. 16 mm color. D.C. Public Schools Media Center "You And Your Grooming"
"Care of Your Clothes"
"Your Face"
"Your Hands and Feet"
"Posture In Motion"
"Body Care and Grooming"
2) View filmstrips on skin care and other areas of grooming.

Other materials included assorted vegetables, manicure set, etc.

Notes: Tie-in - Social Studies, Science, Art.

Evaluation:

As a culminating activity, have each student select an outfit from his/her personal wardrobe which he/she will model for the class. (Emphasize that it need not be a "dress-up" outfit.) The student should be able to explain the reasons this particular outfit was selected (taking into account such things as color, body type, fit, etc.). Note student's poise as he/she talks as well as the suitability of the outfit.

Note: It may be easier to have students pair up and have each member of the pair demonstrate the other's outfit. This depends on the maturity of the class.

Criticism by you or other class members should be done on prepared sheets rather than orally, and may be omitted entirely for a particularly sensitive class.
(Make constructive suggestions at a later date in this case.)

Home Economics

Unit: Your Food Affects You

Purpose:

1. To present opportunities for the implementation and development of an accurate self concept through emphasis on foods.
2. To explore self attributes which will later prove useful in preparing for, entering in, and adjusting to a foods related occupation.
3. To show students how technological development has influenced changes in food practices, eating habits, and preparation.

Objectives:

Upon completion of this unit, the students will be able to:

1. Identify personal food needs or make choices which will meet their needs.
2. Recognize the four basic food groups and the place they in establishing a well-balanced diet.
3. Organize class experiences to provide opportunities for personal application of food knowledge and its affects on the physical, emotional, and social life of the individual.
4. State ten decisions which must be made in selecting foods for individual and family needs.
5. Master the skills which will result from meal planning, preparation and/or selection of foods which can be carried over into wage earning experiences.
6. List jobs available in food related areas and analyze the personal skills, requirements, and development necessary for each.
7. Classify the various degrees of skill and taining needed in foods careers.
8. Exhibit some poise and self confidence through role playing situations.
9. Illustrate the food needs of family members according to age and amount of activity.
10. Demonstrate some characteristics of an individual with a healthy body and healthy mental outlook.

Activities:

To accomplish these objectives the student may engage in activities such as:

1. Charting needs of individual family members according to age, body, build, health and amount and kinds of activities.
2. Making a poster of the four basic food groups using pictures from magazines, newspapers, etc.
3. Writing skit using the basic four as a family's guide to selection of foods to meet individual situations.
4. Dramatize the affects of good food habits on one's mental and emotional attitudes toward life.
5. After viewing film, "Breakfast for B.J." state how breakfast helps one in everyday life.
6. View film "Go Grow Glow". List the nutrients and tell how they function in the body.
7. Using the Basic Four food groups, select a menu, and plan and prepare family meals.
8. Write a skit or role-play experiences related to personal food knowledge.
9. List and describe ten jobs available in food related areas. (Examples: cook, waitress, assistant cook, baker.)
10. Research careers in foods; classify as to training needed.
11. Each student will do a dramatization concerning an area of learning. This may be done as a total class activity, in small groups or individually.
12. Make a small booklet for use with slow learner's entitled "Good Nutrition Is Feeling Good All Over". The content may be illustrated and should emphasize the eating of green and yellow vegetables, having milk everyday, serving juice instead of sodas.
13. Focus - "Communicate Being You" part of being you is communicating your you-ness to others - and to yourself. Write your thought or list topics which show you, for example:

    a. The thing I like best about me is —
    b. The thing I like least about me is —

Materials:

Books

1. People, Food and Science, Cote. Ginn and Company, Boston, 1968
2. Occupations and Careers, Ferngold, Norman. Webster Division, McGraw Hill Book Company; St. Louis, 1969
3. Teen Guide to Homemaking, Barclay M., et al., 1972
4. Opportunity Knows Series, Andrews, M. E., McGraw Hill Book Company, N. Y., 1969
5. Understanding Food: The Chemistry of Nutrition, Tannenbaum, Beulah, et al., McGraw Hill Book Company, 1962

Films and Filmstrips

1. "The Menu Planner", DuPont Company (sound)
2. Film Loop Series -"Food Preparation"
   Super 8mm. McGraw-Hill Films New York, 1970

Charts

1. "Vitamins and Your Baby", Vitamin Information Bureau
2. "Vitamins and Minerals in the Growing Years", Vitamin Information Bureau Booklet - Nutrition Alert, National Canners Association

Evaluation:

1. Objectives numbers two, four, six, seven, and ten can be tested with a written unit test or a series of short quizzes.

2. Have each student prepare a scrapbook in which he plans a week's meals for his own particular family. This culminating activity should take into account all relevant objectives and activities included in the unit. The scrapbook should be illustrated, should contain complete menus, a profile of family members, etc.

Unit III - Exploration

Home Economics

Unit: Exploring the World of Work through Foods, Food Management, and Food Services

Purposes:

1. To make students aware of the tremendously wide range of jobs available in foods and to help them explore self-attitudes for different kinds of work.
2. To explore dimensions of the world of work which will later prove useful in preparing for, entering, and adjusting to a chosen occupation.
3. To furnish students with opportunities to explore work both as an observer and as a participant in the following areas:
    a. Tools and Equipment
    b. Food Production and Preservation
    c. Foods Preparation and Services
    d. Job Market and Management

Objectives: Upon completion of this unit, the student will be able to:

1. Recognize and use properly the small equipment available in school kitchens.
2. Identify and use tools of cookery for each kind of food preparation.
3. Arrange space so that tools are easy to find and easy to put away. (Store near place where tool will be used.)
4. Use accepted work standards which promote efficiency, sanitation, and safety.
5. Define work centers in the kitchen. (Ex. Food preparation center.)
6. Organize large and small equipment in proper work centers.
7. Recognize equipment used in institutional cooking and compare uses and care.
8. Select tools and equipment based on quality workmanship and labeling information on materials and care.
9. Use equipment to the best advantage. (For example, use electric beaters, blender, etc., which contribute to the most efficient food preparation.)

Activities: The following activities may be used to insure the students achievement and satisfaction.

1. Define tool and equipment.
2. Categorize tools according to ones used for:
    (a) Stirring, lifting, dipping
    (b) Beating and whipping

        (c) Cutting, chopping and mashing
        (d) Draining, straining, sifting
        (e) Measuring
        (f) Baking and oven cooking
        (g) Top of range cooking
        (h) For clean-ups
        (i) Miscellaneous food preparation

3. List equipment used for cooking that is essential; list non-essential equipment.
4. Identify small equipment in the school kitchen by its correct name.
5. List the small equipment in the school kitchen and give as many uses for each as possible.
6. Read the instruction booklets of large and small appliances in the school kitchen and write two special instructions for each.
7. Make a chart, using pictures from magazines, showing cookery tools made from different materials such as steel, wood glass, enamel and aluminum. Show how the materials influence use, care and appearance of each item.
8. Tour the housewares department of two department stores and two dime stores. Study the merits of the various kitchen gadgets. Report on which are essential and which non-essential, which save time, which make preparation of food easier, etc.
9. List small cookery tools in you home under two headings:
    (a) Tools especially useful as time and energy savers
    (b) Tools seldom used
10. Make display of measuring tools and equipment according to dry and liquid measurement. Discuss the value of the equipment in terms of recipes you plan to use in class.
11. Prepare skits and act out scenes which illustrate the importance of group planning and working together in the food classroom. Discuss how this may be carried over into future employment.
12. Role-play a situation which becomes explosive because a student borrows needed equipment from the kitchen unit next to her.
13. Role-play a situation where a student shirks her responsibility to do a job she is to do and does another student's job because she likes it better. Discuss the situation as it applies in school and in employment.
14. Tour restaurants and institutional kitchens to see new equipment such as electronic ovens.
15. Visit restaurant kitchens to observe tools and equipment.
16. Tour both public and private kitchens to see efficient arrangements of equipment and centers of work. (V9s9t Beltsville Kitchens, Beltsville, Md.)

Objectives: Upon completion of this unit the student will be able to:

1. Recognize and practice fundamentals which are applicable to quantity preparation of foods and service in job training programs.
2. Compare principles and procedures of food preparation and service used in quantity foods with family-size recipes and family meal preparation.

3. Make a time schedule for the preparation of a meal.
4. Demonstrate various styles of table service for the home and for a restaurant.
5. Practice table courtesies and good manners.
6. Exhibit poise and confidence in playing the role of hostess or waitress.
7. Exhibit knowledge of the entry levels of jobs in food service.
8. Demonstrate the competencies needed for food service jobs.

Activities: To accomplish the objectives, the student may engage in activities such as:

1. Role-play a situation in which a waitress shows a lack of courtesy toward her customers, or a dissatisfied customer.
2. View the film "Job Opportunities in Food Service". Make a list of the jobs in the film. Discuss them in an informal, open class discussion.
3. Interview people who are employed in food service; invite resource people to come and talk to class.
4. Use the listings in the daily newspapers to study employment opportunities.
5. Make tours to food industries, restaurants and cafeterias.
6. Write reports on kinds of jobs available, qualifications and earnings. (Tie-in with Activity number four.)
7. Discuss the importance of training in securing a job in food services.
8. Role-play a situation in which two girls are applying for a job in food service. One girl has acquired much information in her high school foods class and the other girl has had no training. Show how the performance of the two girls might differ.
9. Make a list of advantages and disadvantages of a job in food service. (Tie-in with Activities four and six.)
10. Using information from #6, classify jobs as to educational levels of entry.

    (a) Two years job training in high school
    (b) Two years technical training
    (c) College degree
11. Make displays of styles of table service.
12. Write various types of menus following the principles of planning. Plan and prepare several menus.
13. Collecting menus from different types of public eating places, the students should learn to use new terms found in these menus.
14. Role-play a situation in which a waitress is taking orders for various types of meals (based on the menus collected in number thirteen).
15. Demonstrate menu preparation according to time schedule. Plan and prepare a menu.
16. Organize a menu into four preparation time zones:

    (a) Foods that can be prepared in advance.

(b) Foods which require an hour or longer to cook.
(c) Foods that require less than an hour to cook.
(d) Foods that require last minute preparation.

17. Request consultants from local hotels, restaurants, or restaurant associations to visit the class and discuss job opportunities for waitresses.
18. Observe a waitress on the job. This may be done individually or in small groups.
19. Prepare quick breads, cookies, and salads using work simplification methods.
20. Practice making the foods listed in #19 on a quantity basis to serve in the school cafeteria. Students will estimate the cost of the recipe and of an individual serving.
21. Diagram the table service for family dinner. (Hostess serving.)

Objectives: Upon completion of this unit the student should be able to:

1. Identify the earliest means of production and compare them with current methods of production.
2. Discuss early sources of food and the effect of technology on food production. (For example, refined foods are a result of modern technology.)
3. Discuss the relationship of quantity production to cost of food. List examples of the principle of Supply and Demand.
4. List the effects of supply and the cost of products on proper nutrition.
5. Name ten convenient foods and indicate what production processes have been carried out before the product reached the consumers.
6. Research and be prepared to discuss and identify early attempts at food preservation.
7. Discuss current methods of preservation and indicate which ones are used most often by manufacturing and processing companies.
8. Define preservation and tell why it is necessary. List the principles essential to proper preservation of food.
9. Indicate which methods of preservation can be used satisfactorily in one's home. Discuss changes in the need for home preservation and its affects on the family's nutrition habits. Relate these factors to the units on Awareness and Communication.
10. Recognize the vast job opportunities made possible because of mass production and preservation of foods.

Activities: In order to accomplish the objectives students may engage in the following:

1. Role-play - Divide class into groups; Set up a situation to demonstrate early production of a particular product and recent production of the same product.
2. Prepare an exhibit showing different packaging materials used in processing foods.
3. Visit a supermarket and make a list of the different forms in which foods have been preserved. Take this list and see how many jobs you can describe which were needed to get these foods to their present state of preservation.

4. Compare the cost of foods raised in the home garden with the cost of commercially prepared products.
5. Collect recipes for jam, preserves, fruit butter, and conserve marmalade and note how they differ.
6. Compare the cost and quality of foods canned or frozen at home with those commercially available.
7. Tour food preservation plants or view films when tours are not possible.
8. Visit the Hershey Chocolate Plant. List the jobs you noticed while touring the plant.
9. View film, or slides, "The Story of Fruits and Vegetables" (Planting, Cultivating and Harvesting).
10. Write comparative reports on planting, cultivating and harvesting today as compared to 50 years ago.
11. Read the pamphlet, "Food Industry Careers". Make a list of careers with the qualifications and earnings for each.
12. Conduct a survey to find the extent of home canning and freezing which is being done in the home of students in the community.
13. Demonstrate two methods of preservation for peaches, tomatoes, and other fruits.
14. Invite persons from industry to participate in a discussion on opportunities for Jobs in the Food Industry.
15. Discuss how skills and knowledge gained in food study will serve as a background for a job or career in foods services related to production or preservarion.
16. Role-play:
    (a) Getting a job.
    (b) Getting along with fellow workers on a job.

Divide class into groups of 3-4 members. Have members of one group do a skit about an individual getting a job who when told of the qualifications and level of entry becomes indignant.

Another group will create a situation to show both the correct and incorrect way to get along with fellow workers in given situations.

Job Market and Management

Objectives: Upon completion of this unit the student should be able to:

1. Classify twenty jobs in the foods job market as to workers, manual, skilled, and unskilled.
2. Define a cluster of occupations.
3. Describe occupational changes and trends. What are the predictions for jobs in this particular area?
4. Develop skills and understandings which relate to a family of occupational fields.
5. Define Occupational Families.
6. Explore occupation widely; give information as to qualification, earnings, and opportunities for advancement.

In order to accomplish these objectives students may engage in such activities as:

1. Invite resource person to come in and discuss job opportunities, qualifications, earnings and working conditions in his particular field.
2. Visit school library and/or city or community libraries and select ten jobs on which to do occupational briefs. Share these with class.
3. List steps in the process of choosing an occupation.
4. Choosing from the following list, pick twenty occupations and simulate experiences for each selected:

Analyst (Food and Beverage) research worker, kitchen helper, apple racker, apple sorter, apple washer
Food analyst
Food and beverage control clerk
Fondant puff maker
Food and drug inspector
Food tray assembler (for in-flight service, caterers, etc.)
Food auditor
Food bacteriologist (professional)
Food buyer
Food checker - (Scans loaded trays; cafeteria)
Fruit harvester operator
Fruit Inspector
Fruit mixer (Bake products)
Fruit press operator
Fruit sorter
Fruit stuffer
Food controller
Food demonstrator
Food mixer
Food service agent-driver
Food service driver
Food service supervisor - Dietary Aid
Food teacher
Tester - (food preparation)
Cook - Speciality - Speciality cook of foreign foods
Chef - Supervising Executive
Cook - School Cafeteria - Hotel and Restaurant
Cook - Apprentice, pastry
Cook - Barbecue - Hotel and Restaurant
Cook (boat) - water transportation
Cook - box filler - Slaught and meat rack
Cook - camp

Managers

1. Cafeteria
2. Luncheon

Managers (Cont'd)

3. Catering
4. Cocktail Lounge
5. Coffee Shop and Restaurant
6. Doughnut Shop
7. Food Concession - Food Processing Plant
8. Food Production (Hotel and Restaurant)
9. Trayline Workers
    - Food service worker (Hotel & Restaurant)
    - Food Specialist
    - Food Storeroom (man/women)
    - Food Tabulator, cafeterial (Hotel and Restaurant)
    - Home Demonstration Agent
    - Home Economist
    - Home Economist, consumer service
    - Home Extensive Agent
    - Home Service Director
    - Home Service Representative
    - Frozen Pie Maker
    - Fruit and Vegetable Inspector
    - Fruit Cutter
    - Fruit Farm Foreman

5. List ten sources of information about occupation and types of information to be found in each.
6. List twenty jobs available in the areas of your interest. For ten of the jobs being considered, record the DOT Code, the industry, the DOT Title, physical demands, working conditions and training time needed for each.
7. Make a list of your career alternative by exploring occupational families.
8. Role-play situations applicable to occupations listed in #4.
9. Identify your career alternative by exploring occupational families. This experience will help you to understand that almost every one qualifies for more occupations than he thinks.

Evaluation:

Evaluation for the parts of the Exploration Unit should be informal and continuous. The objectives of the mini-units are best evaluated on a daily basic as activities (most of which are self-evaluating) are carried out.

Materials:

Books:

1. Lesson in Living , Martha J. Davis and M. Yvonne Peeler. Ginn and COmpany, 1970.
2. Teen Guide to Homemaking, Third Ed. Marion S. Barclay, et al, 1972.
3. The World of Food, Eva Medoed. Ginn and Company, 1970.
4. You and Your Foods, Ruth Bennett White , Printice-Hall, Inc, 1
5. "World of Work Kits", Anderson and others. Webster Division, McGraw Hill Book Company. St. Louis, 1969.
6. Andrews, Margaret E. Opportunity Knocks Series. McGraw-Hill Book Comp., New York, 1969.
7. Feingold S. Norman and Others. Occupations and Careers. Webster Division, McGraw-Hill Book Comp. St. Louis, Mo. 1969.
8. The Turner Career Guidance Series. Follett Ed. Corporation Chicago, 1967.

Films and Filmstrips:

1. "Janet and the Genie". 28 min. color. United States Dept. of Agriculture.
2. "All About Cookware". (filmstrip) Ekco Housewares Company, Educational Service Department.
3. Preparing to Cook Series. Technicolor. Available in Standard 8 or Super 8 Silent cartridge. Correlates with 16 mm film of same title. 4 minutes each color Sterling Educational Films,

641.502	"Measuring Terms"
641.502	"Steps in Getting Ready to Cook"
641.4	"Cleanliness and Storage"
641.31	"Selection of Foods"
641.6	"Ways of Cooking"

4. "The Story of Fruits and Vegetables." (41 Frames)
"Planting, Cultivating and Harvesting",
"Shipping to Market".
"Canning and Freezing". Society for Visual Ed. Inc.

5. "Food Groups and How to Cook Them Series" 8mm 4 min Color. Sterling Ed. Films, Inc. or Modern Talking Pictures Services, Inc.

6. "Professional Food Preparation and Research". About 7 min. 16 mm. Modern Learning Cooporation.

7. "The Search For Meaning". (film) Presents Career Opportunities. 5½ min. (Free) Modern Talking Picture Service.

8. "Victory For Health". Useful in Nutrition for Occupational Guidance. (Free).

9. "Food Preparation". Film Loop Series. McGraw-Hill Films, McGraw Hill Book Company, New York, 1970.

Bulletins and Pamphlets:

1. A Guide To Portable Appliances: Sunbeam Corporation
2. How to Buy Fresh Fruits, U.S. Government Printing Office
3. Dairy Foods in the U.S.A., American Dairy Council
4. The Outlook For Women As Food Service Managers and Supervisors
5. Training for Quantity Food Preparation
6. Establishing and Operation of a Restaurant
7. Training Restaurant Personnel
8. A Suggested Guide for Quantity Food Preparation.
   (Numbers 4-8 can be obtained from the Department of Health, Education, and Welfare.)
9. Food Service Sanitation Manual. Utah State Dept. of Health
10. Food Industry Careers. Institute of Food Technologists.
11. Food Service Training Guide. Journal of Amer. Dietetic Associati
12. Food and Nutrition - Handbook of Food Preparation. American Home Economics Association Publication.

Unit III Exploration

Home Economics

Unit: Exploring the World of Work through the Clothing Industry

Purpose: To make students aware of the occupations available in fields related to clothing and narrow down choices to a few preferred careers. This occupational exploration will help in students understanding the world of work in the following areas:

1. Students will study job offerings in clothing and textiles learning of the wide range of opportunities in these fields. They will learn qualifications, levels of entry, etc.
2. Students may engage in worthwhile simulated work experiences.

Textiles

Objectives: Upon completion of this unit the student will be able to:

1. Trace the origin of four natural fibers and four synthetic fibers.
2. Chart the path of fibers to yarn to fabric to garment.
3. Identify at least five different types of fibers. (For example, the Burning Test may be used for wood.) (See appendix.)
4. Select four types of weaves and using minature looms, illustrate the methods of construction. (Tie in: Woodwork - for making frames.)
5. Create fabric designs by using techniques such as block printing, tie dyeing and batiking. (Tie in: Art.)

Activities: To accomplish the objectives, the student may engage in activities such as:

1. Read Chapter 10, "Fibers For Fabric", pp. 342-392 in Dress by Eleanor J. Gowne and Bess V. Oerke.
2. Make a chart of natural and synthetic fibers using natural resources (For example, using cotton balls, wool, coal, water, etc.) to illustrate origin of fiber.
3. Make burning and chemical test on 15 samples of fabrics.

4. Construct minature looms from cardboard, balsam wood, and straight pins or small nails.
5. View four types of natural fibers under the microscope and make drawings of each. (Tie in with Science - How to use the microscope.)
6. Tour the textile museum to see how natural fibers are woven into yarns.
7. Tour the DuPont Nylon Plant in Seaford, Delaware, to see how synthetic fibers are made.
8. Check the absorbency of several fibers by cutting strips of fabric and dipping them into a solution of water and red ink.
9. Make a chart which describes different fibers according to the following criteria:
    - (a) strength
    - (b) absorbency
    - (c) resiliency elasticity
    - (d) Washability
10. View the following films and filmstrips:

    - (a) "ABC's of Man Made Fibers"
    - (b) "ABC of Man Made Fiber Uses"
    - (c) "Spinning Wheel"

    Discuss each.

11. Tour Burlington Mills Showroom in New York City to see fabric constructed, woven and knitted.
12. Carve designs on potatoes or linoleum blocks and print designs on old clothing or sheets.
13. Tie-dye or batik old sheets as a class project.
14. Collect samples of fabrics which illustrate various means of coloring, printing, and designing fabrics.
15. Research the different ways to print and color fabrics.
    - (a) vat dyeing
    - (b) solution dyeing
    - (c) stock dyeing
    - (d) yarn dyeing
    - (e) piece dyeing
    - (f) roller printing
    - (g) screen printing

Tools and Equipment

Objectives:

1. Given a pictorial chart of basic sewing tools and their functions, students will be able to identify and list functions with 90% accuracy.
2. Having watched the teacher demonstrate use and care of 20 basic tools and having practiced good procedures for caring for at least 15 of these tools, the student will be able to correctly use and properly care for any 15 tools with 100% accuracy.
3. After doing research on several kinds of sewing machines, the student will be able to write a brief description of two types of machine.

4. After touring a garment factory, the student will be able to compare a power or industry machine with the school or home sewing machine.
5. Given a list of tools and background information on usage, the student will be able to classify tools as to those most likely to be used by unskilled, semi-skilled, and skilled workers.
6. After talking with community resource persons or specialists, the students will be able to list tools used in jobs of these resource persons.

Activities: To accomplish these objectives, the students may engage in activities such as:

1. Collecting pictures of sewing tools with which they will make a pictorial chart showing tools and functions.
2. Categorize the equipment into: (a) Large equipment necessary to sewing; (b) Large equipment not absolutely necessary for sewing; (c) Small equipment necessary to sewing; (d) Small equipment not necessary to sewing based upon information from Teen Guide to Homemaking, pp 314-318.
3. Write a list of descriptions and functions of tools for, "Guess What the Tool Is".
4. Matching Activity - Tools will be labeled and students will match tool with slips of paper giving functions. This activity may be used as an evaluation.
5. Research and write brief report on the kinds of sewing machines used in homes and industry.
6. Make a comparison chart comparing five features of the home sewing machine with the power/industrial machine.
7. Compare the rating on features of several brands of home sewing machines. (Students may use consumer's bulletin and consumer's report for this.)
8. Make Bingo game cards with tools pictured. Play like Bingo. Caller will read function and/or description of tool.
9. Tour factory where machines are made for additional knowledge on types or kinds of machines.
10. Tour a garment factory with power machines and fabric cutting machines. Compare with home machine and compare cutting a single or double layer of fabric to cutting dozens of layers of fabric at once.
11. Discuss with resource persons the types of tools and equipment they use in their jobs.
12. Make lists of tools known prior to the class activities and list any new one learned.
13. Practice proper use and care of tools and equipment. Write skit to show proper use and care.

Patterns and Pattern Making

Objectives: Upon completion of this topic, the student will be able to:

1. Determine his or her pattern size and type through use of measuring tools.
2. Choose appropriate fabric for a given pattern and/or body type.
3. Design and/or illustrate an original garment.
4. Lay out and cut out a pattern properly using a guide sheet and proper cutting equipment.
5. Draft a simple skirt or pants pattern.

Activities: Students may engage in the following activities to fulfill objectives:

1. Discussion and demonstration of the proper use of measuring tools.
2. (a) Collect fabric swatches.
   (b) Make a pictorial chart showing fabric swatches with suggested patterns and design according to principles and elements of design.
3. Use magazines and newspapers to get ideas for creating dress design.
4. Select a pattern according to one's own measurements and figure type: select fabric suited to patterns and construct a garment using the guide sheet step by step.
5. Do research on techniques of drafting.
6. Draft pattern to suit her/his specific body measurements.
7. Make a garment from the pattern drafted in number six.

Garment Construction

Objectives:

1. Given the materials and instructions for a jiffy project, the students will be able to construct the project with 90% accuracy.
2. After copying new sewing terms from the chalk board daily, the students will be able to define and explain the use of terms listed with 90% accuracy at the end of the unit.
3. Given a guide sheet with sewing terms, students will be able to perform the necessary skills as directed.
4. Using a commercial pattern, the student will be able to construct a garment for self or others.
5. Using the skills learned to construct the jiffy project and the garment, students will be able to make a product to be offered for sale at a bazaar.

6. Compiling information from text, magazines and newspapers, student will compare the price of a ready made garment of comparable quality to a garment made at home or school.
7. The student will be able to research the cost of goods and services as affected by production today. This may be compared to yester year, eg., 1954.

Activities: To accomplish the objectives set forth in the unit on Garment Construction, students may engage in activities such as:

1. Students will use the skills and experiences learned in patterns and pattern making.
2. List the brands of commercial patterns and note any major differences.
3. List information found on the pattern's envelope - front and back. Tell why four things listed are so important to the person who is sewing.
4. Read and interpret instruction sheets in patterns.
5. Make a vocabulary list of new sewing terms.
6. Make a pictorial notebook of sewing terms - giving definitions and illustrations.
7. Practice skills necessary to perform construction tasks such as zipper applications, hem stitches, sewing on fasteners, etc.
8. Construct a simple garment using a commercial pattern.
9. Produce a saleable produce for a bazaar.
10. Compare the cost of a ready made garment of comparable quality to a garment made at home or school.
11. Make a report after researching the affect of production, transportation, etc., on cost of goods on the market today.

Job Market: Marketing and Distribution

Objectives: Given information on manual workers in the experimental instruction system, the student will be able to:

1. Define manual workers.
2. Differentiate between skilled worker, semi-skilled worker, and un-skilled worker.
3. Classify the job prospect from the eyes of a manual worker, i.e., un-skilled (decrease in jobs); semi-skilled (slow increase in jobs); and skilled (great increase in jobs).
4. Place in order the possible earnings of manual worker in each classification.
5. Given background information on some of the careers available in the clothing industry, students will be able to simulate experiences of at least 15 of the following:

fur designer
seamstress
tailor
fashion designer
pattern maker
textile chemist
fashion illustrator
fabric designer
buyer
alteration seamstress
garment cutter
dressmaker
display assistant
clothing repair helper
costume repairer
thread dresser
thread puller
clothier marker
cloth doubler (machine)
cloth bale packer
cloth feeder
cloth seperator
consumer comparison shopper
fabric estimator
fashion photographer
salesperson
display artist
linen room manager
tailor's helper
design helper
drapery manufacturing assistant
weaver
production manager's helper
inspector
model
buttonhole marker
cloth-bin packer
cloth examinaer (hand)
cloth tagger
cloth dryer
grey goods marker
accessories designer
yardage caller
boxing and pressing foreman

6. After reading brief description of careers on prepared study sheets, reading job analysis in the text, and viewing films, the student will be able to categorize each job listed in number five under the heading of:
   (a) Production
   (b) Care
   (c) Display
   (d) Repair of Alterations
7. Write a report on how learning a special vocational skill in secondary school can lead to a better job as a manual worker.

Activities as set up to fulfill objectives in Job Market are as follows:

1. Define manual worker.
   Define skilled worker.
   Define semi-skilled worker.
   Define un-skilled worker.
2. Research each of the above and classify as to degrees of skills needed.
3. Classify as to job availability.
4. List possible earnings in each classification.
5. Looking back at objective five, student may engage in simulated experiences, choosing any 15 of the careers listed.

6. Student will create meaningful roles in careers categorized under the headings of a Production; b Care; c Display; d Repair; reviewing the advantages or disadvantages of each.
7. Tour model agency - example: Barbizon School of Modeling. Determine in class discussion what to look for; have open discussion after the tour.
8. Contact resource persons to come and speak on careers such as:
   - (a) modeling
   - (b) fashion illustration
   - (c) fashion merchandizing
   - (d) sales
   - (e) buying
   - (f) seamstress
   - (g) tailoring
9. Dramatize the role which production plays in affecting a cost of a garment.
10. Dramatize an interview for job of your choice.
11. Research: Write a report or skit on how a special skill in vocational school can lead to a better job as a manual worker.

Evaluation:

Evaluation for the parts of the Exploration Unit should be informed and continuous. The objectives of the mini-units are best evaluated on a daily basis as activities (most of which are self-evaluating) are carried out.

Materials:

Books, booklets

1. Opportunities in Clothing by Irene McDermott
2. Dress by Oerke
3. Designing Your Own Dress Patterns by Loorbies
4. Teen Guide To Homemaking by Barclay
5. Guide To Modern Clothing by Strum
6. Goldenthal, The Teenage Employment Guide 1969, Simmons & Schuster, Inc.
7. Caree[illegible] In Home Economics 1970 by Hoeflin
8. Step[illegible] Clothing Construction

Films, Filmstrips

1. "A B C's of Man-Made Fibers"
2. "A B C's of Man Made Fibers to Use"
3. "Fact About Rayon Fabrics"
4. "Your Retail Store"
5. "Tools For Sewing"
6. "Using Your Pattern"
7. "How Clothes is Made Story of Mass Production"
8. "Careers in Fashion Distribution", by J. C. Penny
9. "Textiles, How They Get to Where You Are"
10. "Learning to Use a Sewing Machine"
11. "How to Read a Pattern', Scholastic Bk. Service
12. "Design Principles in Dress"
13. "Basic Figure Problems"

Other Materials:

1. tape measure
2. tracing wheel
3. pinking shears, scissors
4. pin cushion
5. thimbles
6. pins
7. tailor's ham
8. hem gauge
9. seam ripper
10. iron
11. press cloth
12. needle board
13. ruler
14. wrapping paper
15. pencils
16. drawing paper, etc.

Appendix X

Use a chart such as the following for a burning test to identify different types of fibers:

Not Self Extinguishing

Burns and Chars	Melts and Burns
Soft greyash after glow	Hard Black bead
Odor of Burning paper	Acrylic Chemical Odor
Cotton Rayon	Orlon Acetate Acrylic

Self Extinguishing

Burns Briefly Chars	Melts and Burns only	
		while in Flame
Black crushing ash	Polyester nylon-tan bead	
Odor of Burning Hair	Dynel Black Bead	
Silk Wool Vicuna		Polyeste Nylon Dynel

Unit I. Career Awareness

Mathematics

Topic : Mankind becomes aware of self and environment.

Purposes : 1. To make students aware of their personal strengths and weaknesses with special attention to honesty.

2. To make students aware of their past accomplishments and needed improvements in areas of the basic fundamental operations in mathematics.

Objectives: Upon the completion of this unit students should be able to:

1. Recognize and identify their personal strengths with emphasis upon frankness and honesty.
2. Point out their own weaknesses and work toward their improvement .
3. Take stock of themselves, possibly using a personality inventory, and focus upon answers to the following questions:
    a. Who am I or what am I at this point and time in my life?
    b. How do I see myself?
    c. How do my classmates see me as a person? As a student of mathematics?
    d. Where am I presently?
    e. Where do I go from here? Am I ready to face the future?
    f. What do I really know about the working world?
    g. Have I decided what my life's work will
    h. Do I have the personal qualities that a required for my anticipated occupation?

4. Review their past performances in the area of mathematics, placing emphasis on specific individual needs and interests, and work from where they are to where they can go.

5. Understand that the 9th Grade Curriculum will not be taught in the traditional manner, but rather will focus upon teaching strategies that will be both informative and enjoyable in addition to being practical.

Activities:

1. Administer the personality - occupation inventory questionaire to determine strengths and weaknesses of character and inclinations toward career or occupational preferences. (Confer with home economics and/or English teachers to avoid duplication of this activity.)

2. Have students give written portraits of themselves as they see themselves. Then ask each to compare those images of self to the summary of test (inventory) response.

3. Write the name of a student (per week) on the blackboard or bulletin board; have other students list under that name his/her "good points". Thought question: "How would these traits help a math student or hinder a math student in securing a job?"

4. Ask students to list occupations in which they would like to engage. Later, have an open discussion with classmates as to whether or not the student's personality traits lend themselves to a particular job/jobs.

5. Have students write job descriptions for careers requiring a knowledge of mathematics.

6. Have flow charts made showing where and/or what students hope to achieve or attain within the next five to seven years of their lives.

7. Use the following tools of mathematics; symbols, signs shapes, objects, words, and abstract figures to illustrate that we use and need mathematics to survive.

   Note: Use the 5 senses when and wherever possible.
   Example: A pyramid with a triangular base...
   have the students close their eyes, give them the figures, allow students time to explore, to touch, to smell, etc., take away the objects.. ask for a description of and the geometric name for each object.

8. Diagnostic Test - reviewing essential basic fundamental operations and concepts of mathematics. Use results as a basis for grouping, individualizing instruction, and preparing to begin the year's work.

Materials:

1. Plane and Solid Geometric Figures
2. Flannel and card board numbers and symbols
3. Wooden and pin back numbers, letters and symbols (excellent visual aids)
4. Flannel boards
5. Diagnostic Test of Mathematical Essentials
6. Personality and Occupational Preference Inventory
7. Folders or large envelopes

Evaluation:

1. Return written portraits which students composed at the beginning of the unit. In light of the activities and discussions, have students revise their original portraits, giving reasons for any changes they make. If a student does not wish to revise his portrait, he must tell why.
2. Use the Diagnostic Test (Activity 8) as an evaluation of Objectives 4 and 5.

Sample Diagnostic Test Items

Directions: Perform the indicated operation

I. Add:

1\.
$768.75
836.59
396.86
985.79
298.85
464.62
645.81
737.92

2\.
$985.93
388.75
257 88
567.79
365.57
746.78
997.69
846.96

3\.
$572,892
62,354
789,568
431,225
85,622
41,298
854,777
59,526
238,787
462,685

4\.
27½
$115^{3}/4$
$69^{7}/_{8}$
$283^{5}/12$
$19^{2}/_{3}$

5\.
$34^{5}/_{6}$
$17^{3}/4$
$24^{2}/3$
48½

6\.
36¼
$49^{3}/4$
25½
53½

7\.
$41^{2}/_{3}$
54¼
$36^{1}/6$
$29^{3}/_{8}$
$45^{1}/6$

II. Subtract:

8. 7.8 - 4.9
9. 2.84 - .006
10. .42 - .0025
11. 100 - 6.08
12. 8.14 - 7.356
13. .58 - .015

III. Change to mixed numbers:

14. ${}^{4}/_{3}$
15. ${}^{18}/_{12}$
16. ${}^{8}/_{5}$
17. ${}^{12}/_{5}$
18. ${}^{9}/_{4}$

IV. Multiply:

19. 13ft. 6in. x 15ft. 6in.
20. 12yd. 2ft. 9in. x 5
21. 3750 at $12.50 per thousand
22. $60 \times 1 \times {}^{8}/_{12} \times 16 \times {}^{1}/_{1000} \times \$11.75$

M-4

V. **Divide:**

23. 62 ÷ 40%
24. 75 ÷ 12½%
25. 3300 ÷ $^8/_9$
26. \$1000 ÷ 5½
27. \$1200 ÷ 6$^3/_4$
28. \$ 150 ÷ 8$^1/_3$
29. \$189.60 ÷ .0
30. \$212.80 ÷ .0
31. \$286.25 ÷ .00

VI. **Find:**

32. $^1/_8$% of \$3240 is _____.
33. $^5/_8$% of \$2856.80 is ______.
34. 120% of \$1575.50 is _______.
35. 1$^3/_4$% of \$875 is _________.
36. 652 is 6.4% of ________.
37. ______ % of 1264 is 3
38. ______% of 325 is 1

VII. **Find the decimal equivalent:**

39. $^1/_4$%
40. $^5/_8$%
41. 15 miles
42. 265 miles

VIII. **Complete:**

43. .0825 is equal to ____$
44. 90 is 150% of ______.
45. _____% of 40 is 65.
46. ______% of 65 is 40.
47. .025 is = ______%.
48. 116$^2/_3$% of 24 is ____
49. 2½% of 17,525 is _______
50. 1¼% of 28,750 is _______

Unit II. Career Communications

Mathematics

I. Topic: Introduction to Communication - Mathematics The Communicator

II. Allotted Time Limit - 10 Weeks

III. Purposes:

1. To make the student aware that we live in a world where certain methods of communication are identical or simular in origin.

2. To make the student aware of the fact that communication is divided into two categories:

    a. Verbal Communication
        1. Listening
        2. Speaking
        3. Reading
        4. Writing

    b. Non - Verbal Communication
        1. Seeing
        2. Hearing
        3. Touching
        4. Testing
        5. Smelling

3. To make the student realize the importance of, and need for, both the verbal and non-verbal forms of communication.

4. To make the student aware of the positive and negative responses that individuals make to various forms of communication:

    a. Positive Responses
        1. Being persuaded
        2. Attentiveness
        3. Sustaining interest
        4. Storing information

        5. Showing pleasure
    b. Negative Responses
        1. Rejecting
        2. Protesting
        3. Ignoring
        4. Misunderstanding and/or misinterpretation

5. To make the student aware that correct interpretation (the understanding of) of the symbols of communication is vitally significant in the art of communicating with other individuals.

6. To review or reinforce information from previous career development modules (grades 7 and 8) with special emphasis placed on communication as it is related to mathematics.

7. To stimulate a desire for further dependent and for independent studies in arithmetic, statistics, and other mathematical topics as they relate to occupations.

IV. Objectives: Upon completion of this unit students should be able:

1. To do research on topics:

    a. The Evolution of Man and Communication with Emphasis Placed on Signs, Symbols, and Numbers.

    b. Early Man and Mathematics as a Tool of Communication.

2. To write our early symbols of communication.

3. To tell how early man counted, how he kept track of time, how he remembered or retained numerical facts, how he kept track of his family members, etc.

4. To apply mathematical principles in problem solving and communications.

5. To select occupations of their own choice and write short job descriptions of the occupation.

6. To read, write, and explain the general requirements needed for an occupation listed in a newspaper advertisement.

7. To evaluate ideas, facts, printed data and information critically.

8. To use experience, information, and insight to communicate data clearly and precisely.

9. To make use of the flow chart as a logical means of writing and analyzing mathematical data.

10. To use additional arithmetic and mathematical terms as they apply to practical application.

11. To appreciate the ability and power to utilize, create, and communicate mathematical principles and processes.

V. Activities: Upon the completion of this unit the student should be able to perform in many of the following activities.

1. Research, compile, and analyze data or the following two topics:
   a. The Evolution of Communication as it is related to mathematics with emphasis placed on Signs, Symbols, Objects, and Numbers.
   b. Early Man and Mathematics as a Tool of Communication.

2. Using different materials such as clay, sand, paper, paper mache, poster paper, write the early symbols of communication used by the various cultures. (Caveman, Chinese, Babylonian; etc.).

3. Using short skits; (a) dramatize the procedure used by early man to count, (b) the method used to keep track of time, (c) the method and manner used to retain numerical facts, etc.

4. Select at least five job advertisements from the area newspapers. Have the students write a short job description of the occupations listed, keeping in mind that the job description will later be presented to the class. The student should be reminded that the manner of presentation will bring forth either positive or negative responses from his classmates.

5. Have students write their own job advertisement, exercising the ability to express coherently data or facts to be read or orally presented.

6. Students will assume the role of postal clerk or any desired occupation or career, then using the Flow Chart, determine or calculate the weekly salary of employees, and by using the same method, overtime pay.

7. Have students write letters of application for the following occupations, then dramatize the roles of each:

a. Program timing
b. Commercial timing
c. Speech or recording timing
d. Desirability of data
e. Research data
f. Program analysis (purpose, method, etc.)

13. Have students dramatize actual job interviews -

a. Showing the correct method to apply for a job.
b. Showing the many common mistakes made when applying for a job.

14. Have students do research on the following careers for information on educational requirements, salary, experience needed, pre-requisites, number of hours work per week, job availability, duties of the job, etc.

a. Mathematicians
b. Statisticians
c. Accountants
d. Biological Scientists
e. Geologists
f. Geophysicists
g. Meteorologists
h. Oceanographers

i. Chemists
j. Biochemists
k. Physicists
l. Astronomers
m. Economists
n. Industrial Designers
o. Engineers
p. Architects
q. Systems Analysts
r. Surveyors
s. Urban Planners

Note: Stress:

The education you have and the skills you learn are closely related to the money you will earn during your life.

IV. Materials:

Overhead projector, camera, film, tape recorders, clay, crayons, paper mache, newspaper advertisements, use of the teletrainer, calculator, adding machine, computer, etc.

VII. Tie - Ins:

Language Arts, Fine Arts, Home Economics, Graphic Arts, and Journalism.

VIII. Career Opportunities:

As listed under Activities - Number 14.

IX. Evaluation:

1. Give several examples of both how early man used mathematics, and how we use mathematics today. Compare the use of mathematics as an effective aid to life now and in early times.
2. Given a series of ideas, facts, pointed data and information on various mathematically related careers, students will evaluate them critically using the criteria given in Activities 6, 8, and 9.
3. Administer written test designed to evaluate students' skills in solving mathematical word problems, defining mathematical terms, and using mathematical principles. (Problems should be career or communication centered.)

Unit III Career Exploration

Mathematics: Geometry
Algebra
General Mathematics

I. Topic: Exploration or In-Depth Studies of the specific subject areas of Geometry, General Mathematics, and Algebra

II. Time Alloted - 18 weeks

III. Specific Subject Area - Geometry

A. General Purposes - Along with teaching the course demands of Geometry we wish to:

1. Develop the ability to use an analytical approach to geometric relationship.
2. Provide students with the opportunity to explore specific occupations and careers that are related to Geometry (plane, solid, coordinate)
3. Aid the student in establishing a rationale for pursuing a course of study in Geometry.

B. Specific Objectives - Upon the completion of this unit the student should be able to:

1. Acquire geometric facts and coordinate.
2. Understand geometry as a deductive system.
3. Visualize plane and space figures.
4. Understand relationship of points, lines, planes, and three-demensional figures.
5. Think creatively.
6. Appreciate the practical uses of geometry.
7. Appreciate the place of geometry in our culture.
8. Appreciate the importance of a knowledge of mathematics for the intelligent and useful citizenship.

C. Activities:
General Activities

1. Extras for Experts (basically enrichment materials)

Use challenging and unusual exercises found at the end of textbook chapters and summaries.

Example: 1 - Add $3.04 & $6.25 mentally; write down the sequence or thought pattern which you followed in arriving at your answer.

Example: 2 - Divide the following---

a. $2x^3 - 3x^2 - 6x - 1$ by $x - 1$

b. $x^3 - 8$ by $x-2$

c. $6a^{3x} + 3a^{2x} - 5a^x + 6$ by $2a^x + 3$

Example: 3 - From a tower 430 ft. high on a level plain, the angles of depression of two objects, one north of the tower, and one northwest of the tower, are 30°20' and 47°40', respectively. Find the distance between the objects. Answer 535 ft.

Example: 4 - An architect uses two right triangles made of celluloid. One triangle contains angles of 30° and 60°, while the other has two angles of 45°. Show how by using these two triangles he can draw the following angles: (a.) 15°, (b.) 105°, (c.) 120°. Answers - (a.) 60° - 45°; (b.) 60° + 45°; (c.) 90° + 30°.

2. Just for Fun (recreational mathematics) - make use of puzzling problems and exercises which are instructive as well as amusing.

Example: 1 - Find the angle the sum of whose complement and supplement is 140° - Answer = 65°

Example: 2 - Topic of Quotient Adjustment - The rationale he depends heavily upon the concept of division as repeated subtraction: Have students compare the division problem 28,208 328+ 86 and the multiplication of 86 x 328 + 28,208. Students should be able to draw logical deductions through analysis.

$$\begin{array}{r} 328 \\ \underline{\times 86} \\ 1968 \\ \underline{2624} \\ 28,208 \end{array} \qquad \begin{array}{r} 86 \\ 328\overline{)28208} \\ \underline{2624} \\ 1968 \\ \underline{1968} \end{array}$$

**NOTE: Have students research and discuss the Austrian method of division.

3. The Human Angle — Make use of historical material that stimulates interest in further research or in-depth studies. This is an excellent opportunity for the initial step of Unit III. - Exploration.

4. Vocational Features — Make use of short answer questions, such as: Who uses geometry anyway? This question might also be used as a "Kick-off" for individual projects and subsequently, role occupational playing.

5. Have students organize and conduct a mathematics fair for the school and/or community. This should be a once-a-year affair which could provide an opportunity for enrichment and motivation. Plans for the fair should be worked out by the teacher and class together.

6. Have students display challenging, unusual, stimulating bulletin boards depicting the current topic of instruction.

Specific Activities

1. Projects which call for on-going research and in-depth studies should be carried on throughout the second semester.

   Note: These projects should be used:

   1. to establish a rationale for studying Geometry.
   2. for enrichment materials which should motivate independent study.
   3. to heighten interest in various careers and/or occupations.

   Listed below are a few suggested projects which may take the form of:

   (a) Written reports
   (b) Construction of models of figures, objects, cities, buildings, space relationship, mathematical instruments used now and those which may be used in the future.
   (c) Construction of visual materials explaining a mathematical topic or theory.
   (d) Other creative forms of work on a topic of interest

Suggested Projects:

(1) Advertisements illustrating hidden assumptions
(2) Optical Illusions
(3) Geometric figures in various fields (industry, sports, architecture, nature, trademarks, fabrics, button, advertising, furnishings in the home, etc.)
(4) Congruency (manufacture of automobile parts, patterns, landscaping, etc.)
(5) Curve Stitching
(6) Polygonal forms in industry (bolts, nuts, various other tools used in shops.)

Broader Areas for In-depth Studies (Projects)

(1) Topology
(2) Geometry in the Home
(3) Geometry in Nature
(4) The Fourth Dimension
(5) Mathematics of Crystals
(6) Scale Drawings
(7) Pentagram
(8) Planimetry
(9) Polar Coordinates
(10) Theory of Flight
(11) Pendulum Patterns
(12) Catenary Curve
(13) Map making
(14) The Constitution of a set of Postulates
(15) Sextant
(16) Paper Folding
(17) Linkages
(18) Geometric ornaments (jewelry, furniture, etc.)
(19) Cycloid
(20) Applied Geometry in Shops such as: Woodwork, Sheet Metal, Graphic Arts, Electronic, and Power Mechanics
(21) Graphing in Three Dimensions (space travel., astronauts.)
(22) Spherical Geometry
(23) Four-color Problems
(24) Game Theory
(25) Number Theory
(26) Transit-Motion
(27) Projective Geometry

2. Suggestion: For the interested, capable student - advise the monthly purchase of The Mathematics Student Journal which is published by the National Council of Teachers of Mathematics. This journal includes topics that supplement those from the textbooks; it also includes recreational materials and problem sections.

3. Using role-playing, have students set up an Urban Planners Center according to the following plan:

Urban Planners Center

a. Aim: 1. To set up a replica of an actual Urban Planning Center with offices applicable to the 9th Grade Geometry student, the 9th Grade Algebra student, and the 9th Grade General Mathematics student.

2. Big Project: To Construct A Community.
Specific Roles for the Geometry student:
(Note: Many times certain occupations and/or careers, will overlap. The career of the Architect, for example, could apply to the Geometry student as well as to the Algebra Student.

Occupations and/or Careers that Geometry Classes would play:
1.) Electricians
2.) Surveyors
3.) Architects
4.) Wiring Specialists
5.) Topologists
6.) Industrial Designers
7.) Engineers (Civil
(Mechanical
(Electrical
(Architectural

c. The ultimate goals of the Geometry class would be to:
(1) Lay out a community or building, etc. using map drawings (scale-drawings).
(2) Draw up actual blue prints of buildings, - with emphasis on pipings, water supplies, etc.
(3) Map out plans for the wiring of the entire community, building, or project.
(4) Be accountable for the amount of pollution (noise, air, etc.) in the given area. The students should also give advice on how to lower or end pollution in the community.
(5) Give to the architects a study and a history of the region being built. Such things as erosion and rock formation may be included in this report.
(6) Serve as surveyors providing information for the construction of buildings, and accurately measuring and recording the contours of the land.

4. Have students explore the following careers and/or engage in occupational role playing according to the following two plans.

Job Description # 1
and/or
Occupational Role Playing

Occupation being Considered:	Related Careers:
Mathematician	Engineering, Physical Science, Mathematics, Architecture

Re: Geometry and/or Algebra Students

Topics for Consideration and Discussion (Individual or Group Quest)

Research, Write, Analyze, or Construct!!

(1) Distinguish between theoretical and applied mathematicians in terms of their interests and areas of study.

(2) Describe how different fields extensively depend upon the use of mathematics (i.e., physics, engineering, business management, economics, computer sciences, etc.)

(3) Select from a list of college courses those needed by a mathematician (analytical geometry, calculus; differential equations, algebra)

(4) Research and determine the impact mathematics has had on technological advancement and report findings to the class.

(5) Determine and illustrate (e.g., by a graph) the dispersion of mathematicians in industrial and educational fields to identify areas of greater/lesser employment for mathematicians.

(6) List personal advantages and disadvantages of being a mathematician (e.g., advantages---job security with government, high salary; disadvantages---demanding and precise, limited opportunites).

(7) Describe how at least one famous mathematician made a contribution to society.

(8) Analyze and differentiate the variety of fields in which a mathematician might work (e.g., algebra, mathematical analysis, statistics, applied mathematics, and topology).

(9) Show an appreciation for the extent of precision involved in mathematician's work by preparing a set of numerical tables or charts.

Job Description # 2
and/or
Occupational Role Playing

Occupation being Considered:
Surveyor

Related Careers:
Engineers, Architects,
Map Maker.

Re: Geometry Students

Topics for Consideration:

(1) Describe the duties of a surveyor (e.g., provide information for construction of buildings and highways, accurately measure and record contours of the land, determine boundaries, make maps and charts).

(2) List the employers of surveyors (e.g., government agencies; engineering, architectural, and construction firms; oil industry.)

(3) Define the following terms: transit, altimeter, level, surveyor's chain, elevation, contour map, directional compass.

(4) Show how a surveyor takes measurements and prepares maps by measuring and mapping an area of the school playground.

(5) Describe the setting a surveyor works in and the possible advantages and disadvantages of that setting (e.g., outside, fresh air and activity, bad weather).

(6) Tell what school subjects are useful to surveyors and why (e.g., social studies, language arts, mathematics, mechanical drawing, fine arts.)

(7) Recognize that a surveyor usually works as part of a team and that his work may take him away from his home area.

(8) Describe the pre-college and post-collage entrance requirements for becoming a surveyor.

(9) Explain how, and analyze why, the demand for surveyors is affected by the growing concern for ecology.

Specific Subject Area - General Mathematics

A. Purposes:

Along with the teaching the course demands of General Mathematics we wish to:

1. Aid the student in establishing a rationale for selecting a course in General Mathematics rather than another branch of mathematics

2. Provide the student with the opportunity to explore specific occupations and careers that are related to General Mathematics

3. Aid the student in preparing himself to make affective use of mathematics now as well as in the future.

B. Objectives:

Upon completion of this unit the student will be expected to:

1. Have an effective foundation for further work in mathematics.

2. See that the fundamentals of measurement and the simple forms of geometry have a real place in his life.

3. Have increased his understanding of the nature of mathematical reasoning.

4. Develop greater understanding of arithmetic and mathematical principles and processes.

5. Be able to apply mathematical principles in every day living and in practical problem solving.

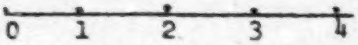
c. Activities:

1. Through the use of flow chart and similar visual aids, have students review, re-enforce, and attack the foundation of mathematics, including the basic fundamental operations of whole numbers, fractions, decimals, and percentage.

2. Have students direct their attention to word problems that are related to a career or occupation:

   Examples:

   a. Occupation: Architect or Engineer
      Problem: This scale was copied from the map of Washington, D.C.

Scale of Miles: 

Complete: On that map, the distance from 0 to 4 on the scale of miles represents ___?___ miles on the ground. A line on the map ___?___ inch long represents 4 miles; ___?___ inch represents 1 mile; ___?___ inch represents 2 miles; ___?___ represents 1/2 mile.

b. Occupation - Statistician

Problem: Make a copy of the table below. Fill in the columns of the table by computing and analyzing the ratios indicated in the first column. Express in three ways.

The Two Lines To Be Compared	The Ratio As Commonly Stated	Ratio Written As A Division	The Relation Stated in Words
a and b	2 to 1	$a \div b = 2$	a is twice b
b and a	1 to 2	$\frac{b}{a} = 1/2 = .5$	b is 1/2 of a
a and c	4 to 1	$\frac{a}{c} = 4$	
c and a		$\frac{c}{a} = ?$	
a and d		$\frac{a}{d} = ?$	
d and a		$\frac{d}{a} = ?$	
a and e		$\frac{a}{e} = ?$	
e and a		$\frac{e}{a} = ?$	
a and x		$\frac{a}{x} = ?$	
x and a		$\frac{x}{a} = ?$	
x and y		$\frac{x}{y} = ?$	
y and x		$\frac{y}{x} = ?$	

c. Occupation - Banker (Can be applied to anyone who wishes to make a loan.)

Problem: If a man charges you 25% per year interest on a loan, is he an illegal loan shark? (Comment: You probably agree that if a man charges 100% per year he is an illegal loan shark, but what about 8% per year? 10%, 25%, 30%, 50%. In about half the states, the legal interest rate on small unsecured loans to individuals is 30% per year.)

Working in groups or committees, have students collect advertisements which offer personal loans, loans on real estate, automobile loans, etc. Get the needed information and discuss the following questions:

(1) Does the advertisement state clearly and definitely the interest rate per year?
(2) Does your state have a legal maximum interest rate?
(3) What methods are sometimes used to raise the interest rate?

d. Have a class project on several methods of transmitting money. Have students bring as many of the following forms to class as they can find:

(1) Express Money Order
(2) Bank Draft
(3) Cashier's Check
(4) Payments sent by telegraph
(5) Certified Check
(6) Registered Letter

Class discussions should revolve around questions such as:

(1) How and when would you go about using each form?
(2) What are the special features or advantages of the form?
(3) What is a forged check?
(4) Why is the penalty for forging a check so very high?

3. Role Playing or Occupational Dramatization

a. Aim: To set up a replica of an actual urban planning center with offices and practice applicable to the 9th or 10th grade student whether his chosen field of mathematics is general mathematics, algebra, or geometry.

Big Project: To construct a community involving all 9th grade students

b. Specific Roles - Occupations or Careers for the General Mathematics Student: (Note: many occupations are mathematically orientated which may cause an overlapping of various branches of mathematics.)

(1) Clerk (commercial or business)
(2) Tax Consultant
(3) Statistician
(4) Computer Operator
(5) Sanitation Engineer
(6) Public Health Inspector
(7) Accountant
(8) Bricklayers
(9) Cement Mason
(10) Property Tax Assessors
(11) Actuaries - (Usually employed by insurance

companies, investment brokers, public health services, or are in the field of taxation. There are only 1,600 qualified Actuaries in the United States.

(12) Environmental Health Program Administrators

c. The ultimate role of the class in General Mathematics would be to:

(1) Inspect and/or set up public health facilities within a given community.
(2) Administer Environmental Health Programs.
(3) Keep and review business records of expenses and income.
(4) Prepare budgets.
(5) Write reports on in-coming and out-going expenses.
(6) Prepare tax forms.
(7) Advertise the Urban Planning Program through art work, television and radio announcements, newspaper and magazine ads and billboards or signs.
(8) Inspect, approve, or disapprove building materials and plans.
(9) Collect, analyze, and interpret data and prepare reports and make recommendations on such matters as is indicated by data collected.
(10) Prepare graphs showing statistics pertaining to the project.
(11) Recruit, interview, and hire employees.
(12) Counsel employees.
(13) Classify jobs and plan wage and salary scales.
(14) Develop safety programs for employers and employees.
(15) Operate machines such as cash registers, accounting machines, change-disbursing machines, calculators, and computors.
(16) Handle business tasks, such as billing, bookkeeping, mail preparing and handling, tabulating, etc.
(17) Give or take dictation and transcribe notes effectively.
(18) Answer mail and/or make appointments.
(19) Answer phone calls properly.

Job Description
and/or
Occupational Role Playing

Specific Occuaption: All Construction Trades

Related Careers: Cement Mason

Re: General or Applied Mathematics Students or Potential Dropout.*

Ideas for consideration and discussion (Individual or Group Quest):

(1) Recognize that the principal work of the cement mason is finishing the exposed concrete surfaces on many types of construction projects.

(2) Describe four sites where cement masons might work (e.g., patios, sidewalks, highways, foundations of houses).

(3) Describe the responsibilities of the cement mason (e.g., supervise laborers, direct pouring of concrete, level and finish surfaces).

(4) List information needed by a mason to perform his job (e.g types of cement, curing times, amount of cement needed.)

(5) Recall and list in order the sequence of advancement for masons (e.g., apprentice, journey man, foreman, superintendent).

(6) Discuss the fact that cement masons are dependent upon weather conditions and explain the causes and effects.

(7) List the skills and/or personal characteristics needed by a cement mason (e.g., good physical condition, manual, dexterity).

(8) Describe the purpose of three tools used by cement masons (e.g., trowel, cement float, whip, etc.).

*By "Potential Dropout" we mean a student whose main concern seems to be getting out of school, no matter what; a student who works well with his hands, but experiences difficulty when "book-learning" enters the picture.

Listed below are additional occupations that may appeal to General Mathematics students - Educational Level: High School or Less:

Note: These occupations may be used in various ways by the teacher - as introductory topics to a unit; for enrichment exercises; as a motivating tool for individual quests; for research projects, etc.

(1) Jobs dealing primarily with things include:

(a) Airplane ground service men
(b) Assemblers in the electronics industry
(c) Bank clerks
(d) Key punch operators
(e) Exterminators
(f) Postal clerks
(g) Upholsterers
(h) Power plant workers
(i) Welders
(j) Data - Processing machine operators

(2) Jobs dealing primarily with people or animals include:

(a) Cashiers
(b) Demonstrators
(c) Hospital attendants
(d) Market research interviewers
(e) Models
(f) Receptionists

General Mathematics

4. Present various budget problems to the class for discussion. Have them work out budgets based on total family income and expenditures. Discuss some of the problems encountered when expenditures exceed income and suggested methods of dealing with this problem.

V. Specific Subject Area - Algebra (Introductory)

A. General Purposes:

Along with teaching the course demands of Algebra we wish to:

1. Have students explore specific occupations and careers that are related to Algebra.
2. Aid the student in establishing a rationale for pursuing a course of study in Algebra.
3. Apply algebraic abstractions and principles to practical situations or everyday problems.

B. Objectives: Upon completion of this unit the student should:

1. Be able to integrate the newer algebra related topics with the usual algebra content.
2. Reflect a contemporary point of view concerning this specific branch of
3. Have experienced, explored, and possibly analyzed the different methods of learning mathematics, especially algebra.
4. Be able to understand and apply the basic concepts of algebra.
5. Have achieved a balance between the development of his manipulative skills and his understanding of Algebra.

C. Activities:

1. Have students draw up a list of careers or occupations that are related to Algebra. Discuss these, and compile a master list for use with the unit.
2. Use the challenging and unusual exercises found at the end of each chapter called "Extras for Experts". This is basically enrichment materials.
3. Use "Just for Fun" (Recreational Mathematics); Make use of the extremely tricky problems.
4. "The Human Angle" - make use of historical materials that stimulates interest into further research or in-depth studies.

5. Vocational or Occupations Features - Answer questions such as:

   (a) Why study algebra?

   (b) Who needs algebra?

   (c) What purpose does algebra serve?

6. Use role-playing or occupational dramatizing

   a. Aim: To construct an urban planning center with offices and office practices applicable to the 9th or 10th grade algebra student.

   b. Occupations and/or Careers that might involve algebra students:

      (1) Architects

      (2) Draftsmen

      (3) Computer Programmers

      (4) Systems Analysts - specializes in programming business and scientific (including mathematics) systems

      (5) Economists

      (6) Commerical Artists

      (7) City Planners

      (8) Industrial Designers

      (9) Advertising Agents

      (10) Meteorologists

      (11) Statisticians

      (12) Actuaries

      (13) Furniture, Fashion, and Interior Designers

b. The ultimate goals of the algebra class would be:

1. To draw up building plans for the construction of the project.
2. Write deeds for and exam deed of/for property.
3. Write contracts (building).
4. To translate ideas, rough sketches, specifications and calculations of engineers, architects, and designers; to make these plans a working product.
5. To make scale drawing of an object showing rear elevation, side elevation, and front elevation.
6. To handle the business and legal end of the construction project.

Evaluation:

Because the 9th grade mathematics classes who use this unit will be actively engaged in occupational role-playing during much of the eighteen week period, the unit becomes largely self-evaluating. A student's performance of his duties in his mathematically - related career will allow the teacher ample opportunity to observe and test his understanding of mathematical principles, problem solving, and knowledge of the use of mathematics in everyday life.

Filmstrips and Films which may be used for enrichment or motivation.

1. "How Long Is a Rod?" Ford Co., 1956.26 Frames; - Color. A history of the development of standards of measurements from early Egypt to the space age. Guide included.
2. "Literacy is Mathematics". University of Nebraska, 1954. 29 Frames; Color
   Designed to show the importance of competence in mathematics by graphically illustrating 29 questions called the competencies. Guide included.
3. "Money, Prices, and Interest". McGraw-Hill 1950-44

Frames - Describes different types of money and defines the value of money.

4. "None So Blind" Anti-Defamation League 1947 - 57 Frames; Color. Presents the origin of prejudice and outlines the course the individual can follow to overcome it. Guide included.

5. "Saving and Investment" - McGraw-Hill, 1951 - 47 Frames. Shows how the level of national income is determined by the interplay of saving and investment, and how it is affected by government expenditures and taxation.

Bibliography:

1. Bowmar, Direction for Tomorrow, "Jobs for the New Generation" Glendale, California, 1972-73.

2. Brown and Snades, General Mathematics. Laidtoir Brothers, Inc. 1964.

3. Clark and Schorling, Mathematics in Life, Basic Course

4. Grove, E. L. and Mullinkin, A.M., Basic Mathematics. American Book Company, Cincinnati, Ohio, 1961.

5. Jacobs, Russell F., Introductory Algebra. Harcourt, Brace and World, Inc., 1968.

6. Kembrell, Grady and Vineyard, Ben S., Succeeding in the World of Work. McKnight and McKnight Publishing Co., Bloomington, Illinois, 1970.

7. Lancaster, Joe J. and Cardwell, Jesse F , Foundations of Algebra. McGraw-Hill Book Co., St. Louis, Mo., 1965.

8. Morgan and Zartman, Geometry. Houghton Mifflin Co., 1968 (Modern Mathematics Series)

9. Mueller, Francis, Arithmetic, The Structure and Concepts. Prentice-Hall, Inc., Englewood Cliffs, N.J., 1960.

10. Olson, M Cherly Adams, Business and Consumer Arithmetic 5th edition, Prentice-Hall.

11. Smith, Lankford, and Payne, Contemporary Algebra-Book One. Harcourt, Brace, and World, Inc., N.Y., Chicago, Dallas, 1962.

Unit I - Awareness

Fine Arts: Music

Purpose: To have students experience the excitement and personal satisfaction of musical performance.

Maturing ninth graders have already used music to express feelings about nature for celebrations, in religion and for pleasure. However, these activities have been more psychological than physical. Imitation and rote have had a strong bearing on their vocal or instrumental production. Therefore on this grade level we want to insure that music finds a permanent place in their lives.

Students are aware of the constant change that modern scientific endeavor has brought about. They should be shown that music, when taught meaningfully, can help establish personal values and enhance the quality of life. It can contribute to personal identity, expand imagination and creativity, and heighten the level of self esteem.

High Impact Motivation:

1. Visit to "Voice of America"
2. Field trips for first hand information
    a. Organ
        1. National Cathedral - organ demonstration
        2. National Shrine - organ and carillon
        3. Trinity Church (13th and G) - noon recitals

    b. Instruments
        1. Technological Museum
        2. Historical Instruments
        3. Departmental Auditorium (Navy Yard)
        4. Navy School of Music (Navy Yard)
        5. Federal City College Music Department

    c. Performers
        1. Students from Howard Music School
        2. Local Artists
        3. Peer Groups in other D.C. Schools (Hart - See Mr. Bel and Project R)

    d. Concerts
        1. Kennedy Center Opera House (Dress rehearsals)
        2. Constitution Hall
        3. Radio City - Stage productions at Christmas and Easter

Unit I - Awareness cont'd

Objectives: Upon completion of this unit the student should be able to:

1. Know what he can be depended on to do in the classroom.
2. Determine the limits of his courage and performance and the extent of his depth of feeling.
3. Be knowledgeable of various styles, periods and types of music available for his intermediate voice.

Activities: To accomplish the objectives the students may engage in the following activities:

1. Choral Singing - 6 to 9 weeks. Adv. I
   - a. Voice placement - Use subtle means of voice testing to discourage nervousness and self consciousness.
     1. Have students read words to a short poem in varied tones of voice.
     2. Pitch songs gradually higher and lower and determine the best range.
     3. Let students compare their voices with popular recording artists and decide their best quality.
        (Do all of these with small groups of 3 or 4)
   - b. Motivate interest and critical judgment by using tape recorders as a regular practice.
   - c. Develop enthusiasm by providing performances for an audience - another class, assemblies, community meetings, special events and churches. Music must be heard.
   - d. Improve speech and tone quality by consistent use of sensitive artistic singing and playing.
   - e. Activities which reinforce minimum requirements of the Choral Music Class:
     1. Demonstrate knowledge of vocal style.
     2. Observe correct posture in rehearsal and concert.
     3. Locate voice parts on various types of musical scores.
     4. Observe marks of expression and follow basic conducting patterns.
     5. Interpret all symbols and terms in music books.
     6. Develop an awareness of many styles of vocal music.
     7. Perform unison and part songs.
   - f. Provide Career Development experiences:
     1. Student Conductors
     2. Music Librarians
     3. Section Leaders
     4. Arrangers
     5. Music Copyist
     6. Accompanist

Unit I - Awareness cont'd

2. Classify instruments by:

   a. Type of sound - (For example, percussions,jingle, ring, shake, rasp, etc.; reeds are shrill, piercing, blaring)

   b. Volume

      1. Loud - Use maracas, drums, cow bells
      2. Soft - Use sound block, jingle bells, soft beaters, triangles

   c. Rhythmic Patterns

   d. Length of sound

      1. Determine how to make long and short sounds by hand control
      2. Vibrations can be sustained or stopped on cymbals, gongs, bells
      3. Short sounds are made by dowel sticks, hollow wood

3. Use of Instruments

   a. Each child should be encouraged to experiment with instruments as a free activity. Set up guide lines to insure musical understanding. Students must decide on the ways the instrument is played and used to the best advantage.

   b. A section of the room should be set up with records and 45's that can be played at a prescribed time.

   c. Soft music can be played during work periods or when materials are being put away. (Tie in all disciplines)

   d. List the title and composer of selections played and put in a conspicuous place with no discussion. (Find a way to determine if students have observed this. "Song of the Week" or "Secret Names" may create interest.)

   e. Use the suggestions given in song books as a guide for performances and enrichment, but always let the students suggest or create others.

   f. When using melody bells or resonator bells, assign one to each child to play when his note occurs in the music.

   g. Advanced students can chart the notes to letter names until note reading is mastered.

Unit I - Awareness cont'd

h. Students can compose instrumental descants or background ostinati for fold songs.

i. Encourage students who own guitars, drums, flutes, etc. to play along with choral groups when feasible.

j. Make tape recordings of any good performance.

4. Rhythmic experimentation

   a. Have the class select a song from a music book. Point out basic beat and note any rhythmic changes. Have one half of class beat the basic time with no variation, the other half beat the notes of the melodic line.

   b. Assign a group of students to compose a "sound piece" in poly rhythms. Use words as an accompanying chant - cities, days, numbers, etc. Each person in a group of 3 to 5 or more must choose a different accent.

   c. Point out the term poly-rhythm and similar terms for vocabulary

5. General Music - Provides an opportunity for expression and discipline through music and gives students an aesthetic awareness of music as a conveyor of cultural traditions. This activity should cause students to:

   a. Read music via of several methods:

      1. Intervals
      2. Song Analysis - form, rhythmic pattern, phrases
      3. Syllables and number of scale tones

   b. Play simple chords on tone bells, piano, or guitar

   c. Write descants and four measure melodies.

   d. Become adept at locating information, finding meanings and interpreting music symbols.

   e. Simulate roles to learn responsibilities of various careers relating to music.

   f. Hear and participate in musical productions. (Have students choose an episode from a current movie, T.V. program or play.)

Unit I - Awareness cont'd

6. Reading or Commentary - Use musicals based on "Self-Image"

The Me Nobody Knows	Mame
Stop the World, I Want to Get Off	Claudine
Don't Bother Me, I Can't Cope	

   a. Invite teachers, former students, newspaper drama critics to discuss any of the plays mentioned.

   b. Have educational trips to see plays in the city or nearby.

   c. Divide the class into interest groups and assign two or three plays to each group for a Saturday or Sunday matinee. Use parents or secure the help of an available teacher to help.

Songs for Unit I

1. "Bridge Over Troubled Water" - Paul Simon
   Publisher - Charing Cross Music, Inc.

2. "I'll Be There" - Bob West & Barry Gordy
   The Choral Sound of Young America - Belivires Mills

3. "Gonna Build A Mountain" - Bricusse & Newley
   TRO - Songways Serice Co.

4. "I Believe" - Arranger - Wilson
   (publisher - same as above)

5. "Who Can I Turn To" - Arranger - Leyden

6. "My Way" - Fancois Revaux and Paul Anka
   arranged by Harry Dexter - S.A.T.B. Charles Hansen

Books

1. The Worlds Greatest Hits of Popular Chorals
   S.A.T.B. - Charles Hansen Ed. Music & Books

2. Music Silver Burdett - Crook, Reeminto Walker
   Published 1974 - General Learning Corp.

3. The Spectrum of Music - Levels 5-6
   with 9 stereo records or cassettes

Gives students help in sight-reading. Contains teaching plans that focus on inductive and multi-sensory learning; beautifully edited.

4. Jug Bands and Handmade Music - A creative approach to theory and instruments. James L. Collier; Grossett & Dunlap Inc. 51 Madiso Ave., New York 10010.

Valuable Suggestions for the Music Teacher

1. Browse through several intermediate texts and select some of the advanced materials for review and reemphasis in The Spectrum of Music:

   The 9th grader is physically and mentally in a better position to under stand and appreciate units like Texture & Musical Architecture.

2. Use some teaching strategies as isolated and separate skills; note re correct tone placement etc.

3. Take more time to teach concepts that heretofore have been more comp too difficult or inappropriate because of age and experience levels.

4. Provide many opportunities for variety in activities, always directin and guiding students toward career possibilities.

5. Utilize the total resources of the home, school, and community.

6. Provide for student participation and planning, exploration and exper tation.

7. Use quality equipment and demand proper care and operation.

Evaluation: Use a variety of methods to get student answers to the follo

1. What is required of each singer in a chorus?

2. Music does much for you, what can you do in return? (Listen, underst its message, react.)

3. What is meant by voice range? What is your range?

4. What is your voice classification?

5. Name three musical instruments that could be compared with each voic

6. Use the sample score and draw a wavy line through the alto part in measure one, soprano in measure two, baratone in three, and teno in fo

7. Octave music has a staff for each voice part. Draw a line through your voice part.

8. Explore the form of three varieties of music. (For example, Fugue, Suite, Spiritual)

9. List ten songs that can be accompanied with simple chords - I,IV,V, VII.

10. Ear training - Write the scale tone number for each exercise as played:

Sample: (1) 21335 (4) 81851
(2) 13558 (5) 31358
(3) 65431

11. Give some differences between old and modern instruments.

12. Improvise a rhythmic pattern for 6/8 time, eight measures.

13. Define ten words that are listed in our music vocabulary.

14. Describe the activity you have enjoyed most.

15. Distinguish between any two instruments used by a different ethnic group.

16. Show that you can feel and interpret the mood of a song in dance.

17. Make a collage illustrating an element of music - style, pattern, rhythm.

Use pictures from magazines and newspapers.

Unit II - Communications

Fine Arts: Music

Purpose: Communication must provide an added dimension to the way people look at life and living. Music activities offer many fantastic experiences; music is communication.

The field of music supplies substance to the world's people as it covers a vast scope of occupations.

This unit will provide students an opportunity to communicate through music as they "Hear, See, and Do" - the slogan for this unit.

Objectives: After 9 weeks of exposure to innovative teaching, encouragement, and guidance, the ninth grader should:

1. Be free of inhibitions.
2. Seek knowledge where needed to perfert personal projects.
3. Include both new and old ideas in music activities.
4. Perform with enthusiasm.
5. Have a wide spectrum of active musical experiences.

To obtain these objectives the teacher must:

1. Encourage creativity and self-expression.
2. Demand respect and order - teacher to pupil, pupil to teacher and pupil to pupil.
3. Set up obtainable goals with student planning and help.
4. Provide materials that are accessible to students.
5. Use all available resources, manufactured and homemade.
6. Keep attractive bulletin boards as an aid to learning.
7. Insert rules, historical facts, and concepts in a lesson whenever the chance arises.
8. Encourage good listening habits and critical observance of music.

Activities: (Students should be involved in the planning and should participate in all activities.)

1. Investigate music of various ethnic groups. Visit the Museum of African Arts, the Ethnic Music Center (Fine Arts Building, Howard University) and the Museum of Technology. The Smithsonian will arrange a demonstration of American folk instruments through its Special Services Department.

2. Purchase programmed learning booklets with filmstrips and multimedia kits from Keyboard Publications, Inc., 1346 Chapel Street,

New Haven, Conn. 05511. Man and His Music is an excellent one; write for price list and sample booklet. Use these booklets weekly. Decide with the students who will lead each topic and divide the duties associated with the total presentation.

a. Display pictures and books about each country or group studied. A unit on India might:

b. Have students read booklet and discuss the differences or similarities discovered.

c. Play records or tapes of Indian classical music; ask students to listen critically and explain new terms if any are suggested. (Rago, Sitar; etc.)

d. Help students improvise accompaniments to Indian poems. This is best done with small bells and a fixed two note drone pattern. FC or CG. The melody is unharmonized and like a chant.

e. Let students try to imitate Indian temple dancers.

f. Secure film from B.W. Information Service of India 3 East 64th St., New York, New York or Embassy of India, 2107 Massachusetts Avenue, N. W.

3. Set up a Concert Bureau

Purpose: To correlate and integrate music activities leading to specific related careers and to provide a means of developing a ddeper appreciation of music per se.

Objective: To provide a real life situation that can be manned throughout the school year.

Method:

a. Appoint or secure volunteers, two for each post.
b. Have a coordinator; chart available seating; keep accurate records.
c. The ticket agent should make and sell tickets.
d. The box office supervisor should tally the numbers and kinds sold, and submit duplicate records to coordinator who will make a report to teacher.
e. A grade level agent should be assigned to each homeroom.

4. Organize each class for various activities:

a. Impresario - check available artists, arrange engagement dates and details.
b. Tour Guides - Collect fees, issue receipts and boarding passes. Check bus rates etc.

   c. Secretary - call to obtain information, ditto details for student-teacher planning.

5. Read the show section of daily papers for current plays, movies, or shows.

Evaluation:

1. Name five occupations that you observed.
2. Compare the plots of movies or musicals.
   a. How were they alike or different?
   b. Was there a story line or plot?
   c. Did it have a message or moral?
   d. Could you identify with any character?
   e. How would you change any part of it?
   f. Look for reviews in magazines and newspaper. Do you agree with the critics opinion?
   g. Try to secure tapes or recordings of the music in 3 or more styles - vocal, instrumental or choral; compare.
   h. Choose favorite roles to dramatize in a skit for a class that did not see the production.

Bibliography

1. The Magic of Music - Jam Handy Filmstrips from Scott Education Lower Westerfield Road; Holyoke, Mass. 01040.
   Includes the following subjects:
   a. "Great Composers & Their Music"
   b. "Mini-Concerts"
   c. "Stories of Music Classics"
   d. Opera & Ballet
   e. "Jazz: - It's Roots"
   f. "Jazz in the Classroom"
2. The Negro in American Culture - Margaret J. Butcher - Alfred Knopf Publisher, New York, (1957)
3. Slave Songs of the United States - Allen, Ware & Garrison - Oak Publications, New York 11968.
4. The Origins & Development of Jazz - Sidney Fox Follett Education Corp., Chicago, Ill. (1968) with Album L25
5. Adventures in Listening - Joseph Mochlis, Publisher, Grossett & Dunlap, Inc., 51 Madison Ave., New York.

Unit III - Exploration

Fine Arts: Music

Purpose: This unit should be versatile and approached to fit the talents and interests of the students. It contains suggestions for multi-media planning. Interdisciplinary understandings can be developed through music by involving team teachers, listening stations and 'funded' program materials.

Objectives: After 8-9 weeks and a practical and objective evaluation, the student should be able to:

1. View music as a major force in civilization.
2. Discuss briefly, historical and social backgrounds of ethnic groups.
3. Relate music to other subjects.
4. Enjoy music with increased receptivity to sounds.
5. Consider Ethno-musicology as a career in music.
6. Use personal tape recorders and cassettes to a better advantage.

Suggestions:

1. Supplement regular classroom equipment with all the audio-media that students own or can provide personally - cassette tape recorders, portable radios, guitars, instamatic cameras and records.

2. With the aid of advanced students, form groups to set up Learning Activity Packets. Use these packets in the following centers:

   a. Sound and Science -
   Use sound experiments from discarded science textbooks.

   b. Electronics -
   Sound equipment, tape recorders and personal instruments may be explored.

   c. Multi - Media -
   Display and make instruments from other cultures. Use their sound in tape loops. Store film strips and slides for use in musical experiments, for background music or accompaniments.

Activities: To accomplish the objectives and utilize equipment, the students may choose from the following activities:

1. Add the libretto to an adapted story.
   Outline the story plan and make up the conversation.

2. Design simple sets for each act after agreement upon a specific setting for your play.
3. Compose music for the theme song of a play or poem.
4. Use the staff lines to compose a song at the blackboard. Let the class help with rhythm and notation.
5. Copy music on staff paper for reproduction on ditto machines.
6. Experiment with the "Black keys" on the piano to make up a tune.
7. For variety, make up a nonsense song using one note and a simple chord accompaniment.
8. Select "artists" from your class to design music sheet covers, program covers and sets for plays.
9. Use the following High Impact Activities:

Experience With Sounds

A. Tape Recorder (Stereo)

1. Reverse Speeds - Record on one, play back on another

Low Speed - Sounds are 8 notes lower - speed twice as slow.

High Speed - Sounds are 8 notes higher - speed twice as fast.

2. Sound on Sound - two sounds on each speaker

a. Play back both channels and record the results on a second tape record.
b. By-pass the erase head when you record a second sound; record the second sound at a lower volume.

3. Sound with Sound - record on channel; rewind the tape and record second sound on channel

4. Panning - Sound moved from speaker to speaker.

a. Hold a microphone in each hand; speak first into one, then the other, switch mike quickly and record. Use the controls on the recorder to switch channels.

* Diagram the style you are using.

Compose a "Sound" Composition or experiment with music.

5. Tape Loop -

a. Detour tape behind erase head, place a piece of masking tape over erase head.

b. Record a sound lasting 3 seconds. Mark with a white grease pencil at the beginning and end.

c. Using a splicing bar, cut out the piece of tape, splice the ends together and form a loop.

d. When played, it should produce a repeated sound.

d. Tape loops may be made of any organized sounds; vary the form as you desire: degrees of dynamics, repetition and contrast, high and low sounds, unusual sound producers.

e. Splice two loops together to make a longer loop. Make a different loop for each tape recorder - use 3 or more.

Plot a duration chart.

0" 5" 10" 15" 20" 25" 30" 35" etc.

Fade the volume in and out for changing the length of sound.

f. Experiment with sounds by changing speeds from that set up originally - fast to slower, etc.

g. Use a variety of "sound producers" for other tape loops:
Paper textures - foil, wax, tissue, tearing, crumpling - whistles, jeers, hissing, smacking, clicking Bells tapped, ringing, muted

h. Make a large tape lopp, place the slack around a smooth straight backed chair. Use this for a canoe effect or sound.

i. Record each part or song on a tape, use 3 tape recorders and start each as in a round. Play over and over.

* Try various combinations by starting the recorders at different times.

* Divide the class into interest groups discuss and chart your ideas then choose "engineers" to make tapes.

If students or teachers can not supply enough tape recorders, solicit parents or community members to share in these activiti Make cassette tapes of the best results for classroom use.

Culminating Activity:

Elaborate on the following idea to produce a musical comedy. Give each student a copy and plan with them how to put across the story.

Trust your imagination and initiative. Make this a team effort and use other faculty members and community resources. This is excellent for correlating Art, drama, English and shop activities.

Title: Pipe A New Tune - an adaptation
(Based on the poem - "The Pied Piper of Hamelin")

Synopsis:

The new mayor and his aides come to Mid-town, U.S.A. and make elaborate promises - in verse and song.

After he takes office, he ignores the pleas of the citizenry outside of his office and refuses to keep his campaign promises - The streets are swamped with people carrying protest signs and making threats about poor conditions.

The people hire a piper - with band and dancers - who lure the children away.

This brings the Mayor to shower them with posters and plans for a new future. He asks each public agent to tell - in song and dance - of plans for better housing, new schools, well equipped play areas, etc.
A spokesman of the people send for the Piper, the children return gradually, looking about and rejoicing with their parents.

They stage a big rally in the middle of Main Street and fete the mayor with music, oratory, and dance.

Stage Setting - Street scene with:

1. Vendors surrounded by tourists.
   Children playing games and jumping rope
   People milling across stage on a warm Saturday afternoon.

2. Narrators - An old man with a cane, an imaginary dog telling the story to two small girls as the curtain opens on scene I.

   Scene I - 2 girls sit on edge of stage - left front.

   The old man sits nearby and they converse about their city, the people, and what is about to take place. Curtain opens and the Mayor and Aides enter as the play begins.

Each character sings an original song about his job - 8 or 16 measures each. Vary the songs with tape loops or nonsense or rhymes and dances.

Scene II - Narrators move to center aisle of auditorium, sit in the audience and make comments throughout the scene.

Mayor's Aides enter, attract attention of small groups milling about the stage. They tell what the mayor can do, and sing his praises to the people.

The Mayor enters to the music of a trumpet fanfare. Everyone on stage chants a chorus in a different rhythm (as in a round). This works up to a loud welcome to the Mayor who has ascended a pedestal in the center of the stage.

Scene III - 6 months later - same as scene I, with dim lights - a Dance of Protest - picket lines form with people chanting threats.

Scene IV - Children play and dance in the streets with the Piper and his band. As the Mayor slowly appears on stage the children leave, gradually following the Piper off stage.

Adults appear in despair and hum sorrowfully asking for the Mayor's mercy.

The Mayor brings on the new planners and makes a new proclamation.

The children, Piper, and Adults parade and "party" around the Mayor and sing a finale.

Narrators announce the end from the back of the auditorium as the curtain closes to music from the orchestra.

Evaluation

1. What did you like best about the production?
2. How many job opportunities were provided in its production?
3. Did each participant seem personally satisfied with his presentation?
4. Was creativity and originality predominant in the play?
5. What part offered the best means of entertainment for you? for others?
6. What provisions were made for community participation?

7. How many disciplines were stressed in the over-all production?
8. Did you grow musically in any way? Explain briefly.
9. Would you consider this an aesthetic experience?
10. Give a critical evaluation of the performance - single out at least 3 points pro or con.

	OPPORTUNITY FOR EMPLOYMENT	APPROXIMATE EARNINGS
Teacher supervisor consultant	1. Public schools(great demand)	1. $4,000-$11,000 per 10 months
	2. Parochial school	2. $4,000-$8,000 " " "
	3. College, University, Conservatory	3. $5,500-$20,000 " " "
	4. Private school, studio	4. $1.50-$25.00 per lesson
	5. Ensembles: instrumental, vocal	5. (see below)
	6. Concert soloist	6. (see below)
	7. Supervisor, consultant	7. $6,500-$15,000
Music Therapist	1. Hospitals: civilian, veteran	1. Average beginning salary $5,500 per year
	2. Clinics for handicapped children	
	3. Corrective institutions	
Instrumentalist	1. Armed forces: Bands, Orchestras	1. Base pay
	2. Symphony Orchestra	2. $90-$350 per week (19 to 40 weeks per year)
	3. Concert Band	3. $15-$30 per concert
	4. Dance Band, Night Club	4. $60-$300 per week
	5. Radio, Television	5. $50-$300 " "
	6. Sound Pictures	6. $100-$400 " "
	7. Small Ensemble: quartet, quintet	7. $20-$200 per concert
	8. Concert soloist(very limited)	8. $100-$4,000 per concert
Vocalist	1. Church choir, soloist	1. $0-$25 per solo
	2. Community Choral Groups	2. Usually no earnings
	3. Radio, Television shows	3. $58-$100 per broadcast
	4. Sound pictures	4. $55-$200 per week
	5. Dance bands, Night clubs	5. $50-$200 per week
	6. Concert choral group	6. $10-$30 per concert
	7. Opera chorus	7. $50-$100 per week
	8. Opera star (very limited)	8. $50-$3,000 per concert
	9. Concert soloist (very limited)	9. $100-$4,000 per concert
Church Music minister of music organist choir director	1. Christian churches (Roman-Orthodox-Protestant) Often jointly held with Church administrative secretary or Directorship of religious education	1. $100-$10,000 per year
	2. Synagogue	2. $100-$10,000 per year

	OPPORTUNITY FOR EMPLOYMENT	APPROXIMATE EARNINGS
Conductor	1. Teacher: College, University, Conservatory	1. see Teacher (above)
	2. Choir-See Church Music	2. $100-$10,000 per year
	3. Radio, Television	3. $200-$300 per week
	4. Dance Bands	4. $10-$2,500 per performance
	5. Concert Band (very limited)	5. $200-$4,000 per year
	6. Symphony (very limited)	6. $5,000-$30,000 " "
	7. Opera (very limited)	7. $6,000-$75,000 " "
	8. Choral group (very limited)	8. $500-$15,000 " "
Radio & Television	1. Script writing, editing	1. $3,000-$10,000 per year
	2. Programming	2. $5,000-$25,000 " "
	3. Producing	3. $5,000-$20,000 " "
	4. Directing	4. $3,000-$15,000 " "
	5. Engineering	5. $5,000-$15,000 " "
	6. Announcing - Disc Jockey	6. $3,000-$25,000 " "
	7. Managing	7. $5,000-$25,000 " "
Tuner-Technician	1. Private business	1. $6,000-$10,000 per year
	2. Dealer	2. $4,000-$ 6,000 " "
	3. Factory	3. $4,000-$ 8,000 " "
	4. College, University, Conservatory, School	4. $4,500-$ 6,000 " "
	5. Teacher: College, University	5. see Teacher (above)
Music Industry (business)	1. Publisher: music, periodicals	According to the wage and salary scale of each indus
	2. Manufacturer: instruments, records	
	3. Manager, booking agent	
	4. Producer of musical shows	
	5. Salesman: music, instruments, records	
	6. Newspaper reporting, editing	
Music Librarian	1. College, University, Conservatory	1. $4,500-$13,000 (may be augmented by teaching)
	2. Public library	2. $4,000-$12,000
	3. Motion picture studio	3. $4,000-$17,000 (usuall includes copyright clearance work)
	4. Orchestra, Band	4. Basic union fee, usuall combined with salary fo library work
	5. Radio, TV station	5. $4,000-$7,500

The above information was compiled in its original form by the music department of the Michigan State University of Agriculture and Applied Science.

Published jointly by the Music T

Science

Purpose:

To help students develop awareness of his inherited capacities which enable him to think cognitively, and to see how he can contribute to solving everyday problems facing him and society.

Objectives: Upon completion of work in this unit, the student should be able to:

1. Make a diagram of the Geologic Time Scale, demonstrating his ability to recognize and cite evidence of the era in which man first appeared on the earth.
2. Group man in his proper place in the animal kingdom.
3. Trace his descent from his ancestors by drawing an accurate family tree.
4. Determine which of the five senses is being used to observe a particular characteristic of an object.
5. Make quantitative observations in studying involuntary responses and natural phenomena.
6. Measure and record scientically the results of his observations.
7. Determine certain properties of materials - viscosity, reflectivity, hardness, and mass.

Activities: To accomplish the objectives, the student may engage in such activities as:

1. A discussion of the Geologic Time Scale.
    a. Try to avoid mere description. Use specific discussion questions, such as:
        (1) How do we know when the earliest man lived?

(2) How do we know what they ate?

(3) How do we know in what sort of environment they lived?

Point out the error in cartoons, television serials, and sets of small models that portray cavemen as contemporaries of dinosaurs.

b. A trip to the museum or a display of cavemen models in the classroom will help stimulate discussion.

c. Students might make sketches of the remains of the early man that have been uncovered and convert these sketches to overhead transparencies. Bulletin board displays can also be prepared.

2. Provide each student with a reproduction of the Tree of Life chart as shown. Tell the class to write in the blank beside, above, or below each branch representing a group of organisms another example which represents that group. Example: Amoeba A could be written on the line beside paramecium. Be sure students understand which group man belongs to.

3. Begin a study of Genealogy, the study of family relationships, by having each student draw his own family tree, noting any inherited traits or a particular pattern that can be traced back through the years. Students might use as research materials:

   a. Old family records, letters, and documents which often establish family relationships back through one or two generations.

   b. Any additional information which may be obtained from relatives and their family records.

Volunteers should discuss their Family Tree with the class.

4. Have students practice using the five senses by conducting the following experiments:

   a. Station #1 - Odor (Smell)

Materials:

(1) Samples of at least one example of the five odors in small, lettered containers:

Spicy - nutmeg, cloves, or ginger
Flowery - a sweet flower or perfume
Fruity - orange, lemon, or apple
Resinous - evergreen (balsam), resin, or turpentine.
Smoky - burned charcoal, leaves, etc.

(2) Prepared tables on which students will record their observations.

Procedures:

(1) Have students sniff the air above each sample. Be sure they do not sniff the sample itself.

(2) Students should try to recognize each, and record the letter of the sample on a prepared table.

(3) Explain how you made the observation.

b. Station #2 - Sound (Hearing)

Materials:

Three tuning forks

Procedure:

(1) Have students listen to the sound made by each of the tuning forks to determine which noise is pitched lower and which pitched higher than a given sound.

(2) Explain how you made the observation.

c. Station #3 - Feel (Touch)

Materials:

(1) Material suitable for use as blindfolds

(2) Many objects, all with different textures - smooth, rough, gritty, slippery, etc.

Procedure:

(1) Blindfold each student before he begins the experiment.

(2) Have students feel several objects which have been numbered.

(3) List each sample and describe how it feels.

(4) Explain how you made these observations.

d. Station #4 - Taste

Materials:

(1) Numbered eyedroppers, one for each sample.

(2) Samples of the following:

  a. vinegar
  b. sugar solution
  c. weak lemon juice
  d. salt solution
  e. honey solution
  f. quinine tonic, baking soda, or alum.

Procedures:

(1) Drop a small amount of the solution on students' tongues.

(b) Have students list each sample and describe its taste.

CAUTION: Remind your students that many of the chemicals used in a laboratory are poisonous. It is unwise, even dangerous, to taste any chemical.

e. Station #5 - Color (Sight)

Materials:

Three objects of different color or a color blindness test chart.

Procedure:

Have students describe the color of each of the objects, telling how they made the observation.

5. Have students time the rate of their heartbeat with a clock or a watch with a second hand. Each student should try to answer the following questions:

  a. How fast does your heartbeat?

    b. Is the heartbeat of the students on each side of you the same as yours?

    c. If they are, what can we infer about involuntary actions such as heartbeat? If they are not, what can we infer? Are the rates the same for all members of the class?

    d. Does this tell us anything about human behavior? Why or Why not?

6. In order to try and answer the question, "How often do people blink?" have each student study several people. Students should observe the subjects:

    a. During normal activity, such as reading

    b. While flashing a light

    c. During normal conversation

    d. In bright sunlight

   Record the typical or usual rate of blinking for the people you study.

7. Have students try to determine how fast people breathe. Let the class decide on the method they wish to use in making this observation.

8. Have students observe and measure scientifically by trying the following:

   From a newspaper determine the approximate time of sunset. Even though students may not be able to see the sun itself because of trees and buildings, they can observe the sky and any changes in it. Each student should take brief notes as he observes. After the sun has set students may write a complete description of the sunset from their notes.

   Compile on the board a list of properties described. Each student can see what he included that others might not have and what he omitted. Look for these: time, sun's location, apparent size, color, shape, sky's color, type of clouds, intensity of light, temperature, movement of air, color of buildings, shadows, effects on animal life.

9. Students will continue their experiences in observation by observing outdoors. Use the following procedure:

Materials:

(1) Hygrometer
(2) Thermometer
(3) Data Sheets

Procedure:

(1) Choose a portion of your outdoor surroundings for study. It may be the school yard, a nearby park or woods, or your own backyard. After choosing a spot, have the students quietly observe what they can see. If they wait quietly for at least ten minutes, the animals which are disturbed by their coming will probably return. (Animals include insects).

(2) Use the Data Sheet to record observations.

Data Sheet

Observer: ____________________

Date: ____________________

Weather:

Temperature: ____________________
Humidity : ____________________
Cloud Cover: ____________________

Vegetation: 1. The most common plant is: (Sketch, describe, and name. Check library if needed).

2. The trees have the following appearance.
____
____

3. Animals: List as many as you observed.

4. Ground: The surface of the ground has the following appearance:

1. ____________________
2. ____________________
3. ____________________

5. General Observations: Describe in a paragraph what you observed.

10. In order to determine certain properties of materials, have students perform the following experiments. Set up four stations.

Materials and Equipment: (Examples given are suggestions only; substitute freely).

Station #1 - Transparency

glass
wax paper
empty test tube
test tube with water
plastic
tissue paper

Station #2 - Hardness

Use a penny and nails as tools.

copper
calcite
granite
glass

Station #3 - Viscosity

Use vials of liquid with lead shot.

water
mineral oil
glycerine
starch solution
cod liver oil
syrups
hair set lotion

Station #4 - Reflectivity

Standards:

black paper
stainless steel
white paper
mirror

Samples:

ceramic tile
black marble
glossy paper
piece of brass (or any metal)
paper towel

Procedure:

(1) Have students work in groups of three at the various stations.

(2) Prepare a scale for each student similar to the one below. Stude will conduct the various experiments and write the samples in the proper places.

(3) Class discussion may follow completion of experiment.

SCALE

1. **Transparency:**

No light (Opaque)	Some light (translucent)	Complete light (transparent)
1	2	3 increasing
List 1—	1—	1—
2—	2—	2—
3—	3—	3—

2. **Hardness:**

Could be scratched by a fingernail	Could be scratched by a penny	Could be scratched by a nail.
2	3	5 increasing
List 1—	1—	1—
2—	2—	2—
3—	3—	3—

3. **Viscosity:**

Shot fell through fastest (Least viscous)		Shot fell through slowest (Most Viscous)
1	2	3 increasing
List 1—	1—	1—
2—	2—	2—
3—	3—	3—

4. **Reflectivity:**

dull 1	2	3	4 increasing
List 1—	1—	1—	1—
2—	2—	2—	2—
3—	3—	3—	3—

Evaluations:

1. Students will demonstrate their knowledge of the era in which man first appeared by writing a short essay which supports or refutes a given statement. (Prepare, in advance, several statements related to the Geologic Time Scale, approximately half of which actually refer to the era of man.) Pass statements out. If the statement is true, the student's paper should provide supportive evidence, if false, it should provide that evidence which would prove that man did not, or could not have existed then.

2. a. Given a list of animals, students should pair those that are in the same Class.

   b. Given a list of Classes and a list of animals, students should place each in the proper Class.

Example:

Reptiles	Mammals	Birds	Amphibians

Classify:
cat
kewi
frog
turtle
whale
duck
man
toad
snake
monkey
alligator
robin

3. Objectives #4 - 7 should be evaluated at the end of the activity to which each refers.

Reference Books:

1. Brock, J. A., Paulsen, D. W. and Weisburn, F. T. Patterns and Processes of Science. Lexington, Mass., Raytheon Ed. Co., 1969. pp. 4,5,24,83— 91

2. Curtis, Francis D. Biology The Living World. Boston, Ginn and Co. p. 79

3. Liebberr, Harold G. Biological Science, Patterns and Processes New York, Holt, Rinehart and Winston Inc., p. 9

4. Mason, John M. and Peters, Ruth T. Life Science: A Modern Course New York, American Book Co., 1969. p. 84-88.

5. E.S.C.P., Investigating the Earth, Houghton Mifflin Co.; pp. 423-430.

6. Gamow, George, Matter, Earth, and Sky. Englewood Cliffs, New Jersey. Prentice - Hall Inc., 1958. pp 397-409.

7. Rasmussen, F.A., Holobinko, P. & Showalter, V.M., Man and the Environment. New York, 1971. pp. 13-33.

Films and Filmstrips:

2230 - "Archeology - Pursuit of Man's Past."

2102 - "Time, Lines and Events."

719 - "Prehistoric Times - The World before Man."

979 - "Age of Mammals"

1041 - "Discovering Fossils"

Science

Purpose: To increase student's understanding of communication by showing him:

(1) How it reaches him through his senses - sight and hearing in particular.

(2) How one communicates by talking, writing, signaling, gesturing, singing, drawing, and even dancing. To express the ways man has developed such devices as radio, television, telephones, and motion pictures to communicate with people beyond the ordinary limits of sight and sound. To further inform the student of the fields of employment related to communication and media.

Objectives: Upon completion of work in this unit, the student should be able to:

1. Recognize various means of communication
2. State, in writing, certain specific types of signals under each of the following categories:
    (a) Distress signals
    (b) Weather signals
    (c) Aircraft signals
    (d) Marine signals
    (e) Military signals
3. Trace the history of communication from the oldest methods of speaking, writing, and drawing to the methods of today.
4. Explain the significance of communication in business and industry.
5. Explain the importance of communication in agriculture.
6. Cite some uses of communication in transportation
7. Construct posters which communicate and express individual ideas concerning the problems of today.
8. Develop an alphabet for communication.
9. Make a diagram of a telephone and explain how it changes sound waves into sound like electric waves.

10. Explain how a T.V. operates and discuss the important role it plays in communication.
11. Relate radio and television frequencies to wave lengths.
12. Set up a simple telegraph system in the science laboratory and communicate by using morse code.

Activities: To accomplish the objectives, the students may engage in activities such as:

Activity I: Student will list as many common examples of communication as he can think of.

Below is a list of some common examples of communication which you, the teacher, might wish to share with your students.

1. A baby cries when it is hungry.
2. We wave hello or good-bye to a friend.
3. A dog barks and wags its tail to show joy.
4. Machines also communicate; a dial on the dashboard of an automobile indicates the temperature of the engine.
5. The ringing of the alarm clock tells us it's time to get out of bed.
6. The clatter of dishes in the kitchen tells us that breakfast is being prepared.
7. Traffic lights tell us whether we can cross the street safely.
8. Newspapers tell housewives about bargains at neighborhood shopping centers.
9. Radio and Television weather reports help us plan what we wear.
10. The mailman brings a letter that tells us a relative is coming to visit.
11. Radio broadcasts alert policemen so they can rush to the scene of a crime or accident.
12. Fire alarms send fire trucks speeding on their way to battle blazes.
13. The scream of an ambulance siren warns traffic so that doctors can bring sick persons to hospitals quickly and safely.

Activity #2: Gestures and Signals

This activity may be done in a number of ways. One suggestion is role-playing. Divide the class into two groups and have each group make gestures or give a signal while the other group tries to guess what is being communicated. Groups will alternate.

Listed below are just a few of the many gestures and signals man uses everyday to communicate.

(a) Smile
(b) Frown
(c) Tip the hat
(d) Hold up your hand to say that you want to recite in class
(e) Hold up your hand in another way to say, "Stop".
(f) Squeeze a friend's hand to communicate sympathy or love.
(g) Vary the tone of your voice in saying the same thing to communicate anger, fear, love, impatience, etc.

This activity might be followed by having the class to discuss or list certain specific types of signals under each of the following categories:

(a) Distress signals
(b) Weather signals
(c) Marine signaling
(e) Military signaling

Activity #3: Making a Scrapbook or Notebook on Communication

Trace the history of communications. In a scrapbook or notebook keep a record of all methods of communication starting as far back in time as possible. Include such methods as talking, using the sun, smoke signals, etc. Put pictures of these various methods in your book. Share your findings with the class. (Tie in with social studies.)

The next three activities deal with the uses of communication in business and industry, agriculture, and transportation. These activities may be handled in a number of different ways.

Activity #4: The students will research or discuss the use of communication in business and industry from a scientific point of view.

Suggested topics or ideas:

(a) Salesmen rush their orders to factories by telephone and telegraph.
(b) Stock tickers flash the news of ups and downs in stock - market prices.
(c) Newspapers and magazines bring businessmen up to date information on the condition of the business world.

Activity # 5 The student will research or discuss the use of communication in agriculture.

Suggested topics or ideas:

(a) Speedy communication helps protect crops against floods, frosts, and other hazards.
(b) Newspapers, magazines, and government bulletins bring news of the latest development in agriculture. For example, a government bulletin might tell a farmer about a new insect killer.
(c) Communication brings the latest news about crop and livestock prices.

Activity # 6 The students will research or discuss the use of communication in transportation.

Suggested topics or ideas:

(a) The mailman delivers a letter which must be transported from one place to another.
(b) Signals tell train engineers whether the track ahead is clear.
(c) Radio and radar guide airplanes to safe landings.
(d) Charts help sailors bring their ships into harbors.
(e) Road signs and road maps keep us from getting lost when driving or hiking.

Activity # 7

(a) Research and be prepared to discuss many of the things which aid navigation: 1. radar, 2. networks called loran, 3. G.C.A. (Ground Controlled Approach for Airplanes), 4. radar-type instruments on satellites.
(b) Make a file of clippings from magazines and newspapers on the place of communications in your lives.

Activity # 8 a: Pictures and Symbols

Sponsor a poster contest in your school which will use pictures and symbols as a means of communicating student ideas on a particular theme. Involve not only your students, but invite the entire student body to participate. For example, your poster contest may use as its theme, Ecology.
In this case, you may wish to seek additional help and advice by calling Mr. Granees Smith at the Dept. of Environmental Center 629-5145. Certificates for winning students may be secured free. In the past,

students who have made outstanding contributions in Ecology have been invited out to dinner with a member of the Washington Redskins at the expense of the environmental center.

On the next pages are sample information sheets which may be used as guides.

(Name of School) ________________ Junior High School, D.C.
ECOLOGY-ENVIRONMENT-POLLUTION: POSTER CONTEST

Date: ____________

OVERVIEW:

THIS IS A CONTEST OF IDEAS COMMUNICATING AND EXPRESSING INDIVIDUAL CONCERNS AND OUTLOOKS ON THE PROBLEMS INVOLVED IN ECOLOGICAL BALANCE. THE TERM "OURS IS A POLLUTED WORLD" HAS MEANING FOR ALL OF US THAT LIVE WITHIN THIS SHADOWY FUTURE.

POSTERS MAY COMMUNICATE HOW MAN HAS CHANGED HIS WORLD TO THE EXTENT THAT IT HAS BECOME A THREAT TO HIS EXISTENCE UPON THE FACE OF THE EARTH. POSTERS MAY ALSO REVEAL PLANS FOR CORRECTING THE BALANCE IN AIR, WATER, LAND, SOCIETY, AND SOLID WASTE. YOUR IDEA IS THE BEST ONE ... USE IT. ENTER NOW.

WHO MAY ENTER?

ALL STUDENTS CURRENTLY ENROLLED IN THE ____________________ JUNIOR HIGH SCHOOL.

1. ALL TEACHERS ARE REQUESTED TO ASSIST AND SUPPORT THIS EFFORT.
2. INVITE INTERESTED COMMUNITY, CIVIC, AND SOCIAL LEADERS TO LEND SUPPORT TO THIS EFFORT WITH MATERIALS, FINANCE, OR IN ANY OTHER APPROPRIATE MANNER SUITABLE FOR PROMOTING ENVIRONMENTAL AWARENESS IN STUDENTS AND OTHERS OF THE COMMUNITY.

REGISTRATION BEGINS (SPECIFY DATE)

RULES AND REGULATIONS:

ALL PERSONS REGISTERING FOR THE CONTEST MUST DO SO AT THE TIME STATED OR THEIR PROJECT WILL NOT BE JUDGED.

ALL PROJECTS MUST BE DISPLAYED ON CARDBOARD, POSTERBOARD OR ON SUITABLE MATERIAL OF THE FOLLOWING SIZES 18" x 24" BY THE DEADLINE. (SPECIFY DATE)

ALL PROJECTS WILL BE DISPLAYED AND JUDGED FOR AWARDS, PROVIDING THEY MEET THE REQUIREMENTS.

1. STUDENTS ENTERING THEIR WORK IN THE CONTEST MUST PAY A 10¢ REGISTRATION FEE. (THIS FEE WILL BE USED TO PAY FOR AWARDS)

2. NAME AND GRADE MUST APPEAR ON THE BACK OF THE DISPLAY ONLY.

3. THE TITLE OF YOUR DISPLAY MUST BE LEGIBLE AND WRITTEN ON THE FRONT OF THE POSTER.

4. NO PRIZES WILL BE GIVEN FOR DUPLICATIONS OR COPIED WORK.

(IDEAS MAY BE DUPLICATED UNKNOWINGLY, BUT THE SAME POSTER WILL NOT BE DUPLICATED EXACTLY UNLESS THE SAME PERSON IS DOING THE TASK, AND THIS NOT LIKELY.)

5. IF YOU WISH TO REGISTER PLEASE SEE (DESIGNATE THIS RESPONSIBILITY TO ONE OF THE STUDENTS, UNLESS (TEACHER) CARES TO HANDLE IT HIMSELF) IN ROOM #____.

REGISTRATION:

THIS IS TO CERTIFY THAT I DESIRE TO PARTICIPATE IN THE CONTEST ABOVE: DATE __________ FEE PAID __________

____
Signature of Registrant

____________________ Junior High School C. D.

Poster Information

Title of Poster ____________________

Subject Area of Poster ____________________

Grade ____________________

1. What ecological principle or principles are you illustrating?

2. How did you become interested in doing this poster?

3. What were some of the difficulties you experienced in developing your poster?

4. How long did you work on this poster?

5. Where did you do most of your work?

6. Do you plan to continue study on this topic? If so, what do you intend to do?

Activity 8b: The Alphabet

Alphabet is the series of letters used when communicating in writing. The word, alphabet comes from alpha and beta, the first two letters of the Greek alphabet. Most English books, magazines, and newspapers are printed in the 26 letter alphabet called Roman, but the Romans did not invent it. They put finishing touches on a system that had been growing for thousands of years.

a. Study alphabets other than our own. (Russian, Hebrew, Chinese.)

b. Have the class develop an alphabet of its own and use it in various ways. This may be done as a class project.

Activity 9: Communication through the Telephone

a. Write to your local telephone company. They will send you stories and pictures to help you understand the telephone better and may send a person to your school to bring demonstration materials. Telephone Companies have fine movies about telephone service too.

Call Julius Beil of the Telephone Company at 466-5427. He has been known to give large demonstrations in the school auditorium involving the students. He will also supply materials for student projects. See Activity 14.

b. Look up the story of the invention of the telephone. It was invented by a college professor who was doing science research to help the deaf.

c. Take a telephone apart, diagram and label its parts. See Activity 14.

Activity 10: Television

a. Bring in and demonstrate a photogtaphic light meter, and demonstrate its ability to measure different amounts of light energy. Try it with lights of different colors (tree lights) but of the same strength.

b. Visit a television repair shop and have the man show you the way in which the picture is made on the CRT. (Cathode ray tube.)

c. Show the class a small transistor radio with the back open. Explain the absence of vacuum tubes.

Activity 11: Chart of Radio and T.V. frequencies

On the chalkboard, make a chart showing radio and television stations in the order of the frequencies on which they operate. Find out from an encyclopedia, how the frequencies are related to wave length, and write the proper wave length beside each frequency. Multiply each wave length by each frequency. What has been discovered? Now look up the speed of light in centimeters per second. You should make another discovery.

Integrated Activities

Some of the following activities may help the students in deciding whether or not they are interested in a career that is related to the Science and Technology of Communication.

Activity 12: Learn the Morse Code. Use it to communicate by flashing lights, or by some form of electric telegraph.

Activity 13: Visit a telegraph office. Find out what kind of equipment is used.

Activity 14: Visit a telephone exchange. Find out all you can about how a telephone call is made. While there, check with the employment office and ask what qualifications are necessary to be a telephone operator, a repairman, or a lineman. (Tie in with activity 9.)

Activity 15: Visit a newspaper office, a radio newsroom, or a weather station to see a teletype in use. At a weather station, the student will observe both the sending and receiving of teletype messages, often in code.

Activity 16: Some of the more interested students may wish to write to the Amateur Radio Relay League, Hartford, Connecticut. This is The National Association of radio "hams". Ask for suggested reading materials and other resources through which one can learn about amateur radio.

Activity 17: It should not be too difficult to find an old T.V. Let the class take one apart and become familiar with its parts. The students must be extremely careful when handling the big picture tube or cathode ray tube. This tube must not be broken.

Call Mrs. Eleanor Brown; WMAL Personnel office 398-5119. She should be very helpful in terms of career opportunities in the T. V. industry.

Materials: Books for the teacher:

1. Brandwein, P., Beck, A., Shrahler V., Exploring The Sciences. New York, 1964., pp. 424, 458
2. Bianc, Sam C., Fischler, A., & Gardner, O., Modern Science: Forces, Change, and The Universe. New York 1967
3. Brandwein, P., Stollberg, R. & Burnett, B., Energy, Its forms and Changes. New York, 1968
4. MacCracken, H., Decker, D., Read, J. and Yarian, A., Physical Science New York, 1968

Films:

1. 136 "Development of Communication"
2. 2328 "Effective Writing - Learning from Advertising Language."
3. 2304 "Telephone for Help."
4. 2078 "Television Serves Its Community."
5. 1393 "We Learn about the Telephone."

Evaluation: The objectivies in this unit may be evaluated in one or more of the following ways:

1. Objectives # 1,2,4,5, and 6 - Administer a written test or quiz.
2. Objective # 3 - The student's ability to perform this objective will be evaluated through the finished product on the completion of Activity # 3.
3. Objectives # 8 - 12 - Set up a series of demonstrations which will require students to diagram, see up, or explain orally the operation and/or use of a telephone, a TV, radio and TV frequencies, the telegraph, or an alphabet.

Unit III. Career Exploration

Science: Astronomy

General Purpose: To fulfill the wishes of those students who seek in-depth study in a single subject area of science.

Purposes: To seek answers, by way of observations and experimentations, to many questions about everything the student sees in the sky.

To help the student understand how far away the heavenly bodies are, and how they move through space.

Objectives: Upon completion of the work in this unit, the student should be able to:

1. Explain and demonstrate the motions of the solar system.
2. Calculate the speed of the earth.
3. Demonstrate and explain the phases of the moon.
4. Observe and estimate the approximate temperature of stars.
5. Calculate the distance light travels in one year.

Activities: To accomplish the objectives, the students may engage in activities such as:

1. Provide the students with strings, pins and pencils and have them draw an ellipse. This may be accomplished by tieing the ends of a piece of string together to form a loop under the pins. Keeping the loop of string tight against the pencil point, move the pencil around to show how planets move in an elliptical orbit.

2. The sun is the center of the solar system. It is the closet star to the earth at an average distance of 92,900,000 miles. With the following formula, the students will be able to calculate how long it will take to travel to the sun in a spaceship at a constant speed of 25,000 miles per hour.

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}}$$

3. Have the students to calculate the speed of the earth. The following information should be helpful. The average distance from the earth to the sun is 92,900,000 miles and takes 365.25 days to complete one revolution. Formulas $C = 2\pi r$

$$\text{Speed} = \frac{\text{distance}}{\text{time}}$$

4. Calculate the distance light travels in one year.

5. Set up observation stations to help the students understand that light from the sun is reflected from a planet. Group the students, and provide each group with a lamp and a tennis or ping pong ball. Place the lamp on a table in a darkened room with the light going out in all directions. Using the tennis ball to represent a planet, place it in different positions on the table.

   Using the above equipment, have the students demonstrate and study the different phases of the moon.

6. In order to help students calculate the temperature of stars, provide the following information.

   Astronomers use the color of light produced by a star to estimate its temperature. They have found that red stars are the coolest (about 3,000 °C), yellow stars are warmer (about 5500°C), and blue-white stars are the hottest of all stars (about 11,000°C).

   Set up stations equipped with pliers, steel needles and a Bunsen burner. Using a pair of pliers, the students will hold a steel needle in the flame of a Bunsen burner. The students should observe the changes in color of the needle as the temperature increases.

7. Constellations: This activity shows the apparent shift in the stars. The Big Dipper is high in the sky in the spring and low on the horizon in the fall. The Constellations seem to move around the North Star.

   Make available a set of Christmas tree lights. Punch holes in different places in a piece of cardboard large enough for the lights to go through. Have a student stand on a chair, holding the cardboard with the light up in the air. Darken the room and light the bulbs. As the students walk in a circle around the room, they should note the position of each light bulb in its relation to the other bulbs.

   Have the students cut pieces of cardboard in sizes of 35mm slides. With the aid of a sky chart, the students should be able to punch out the shapes of various constellations seen in the Northern and Southern hemispheres. Darken the room and project these on a screen.

8. Field Trip: Visit a planetarium .

   Have the students demonstrate and/or discuss the following:
   1. The effect of the earth's tilt.
   2. How light is affected by the earth.
   3. Make and demonstrate a compass.
   4. The action of a pendulum and its causes.

5. How inertia causes the bulge of the tides opposite the moon.
6. How a rocket moves.

Astronomy Careers

Most professional astronomers teach at colleges and universities. They may also conduct research at an observatory connected with a school or at a national observatory. Many astronomers also work at planetariums, where they lecture and conduct classes for the public.

A student who plans a career in astronomy should take as much mathematics and physical science as possible in high school.

Further information about careers in astronomy may be obtained from the American Astronomical Society, Princeton, New Jersey.

Materials:

Books for Students and Teacher

1. Wolfe, C. W., McCombs, L. W., Earth and Space Science. Massachusetts, 1971.

2. Bishop, M., Lewis, P., Focus on Earth Science. Ohio, 1969.

3. Blanc, S., Fischler, A. & Gardner, O. Modern Science: Matter, Energy & Space. New York, 1971.

Films.

1. 2267 - "How We Study the Sun"
2. 1685 - "Nearest Star: The Sun and Solar Activity"
3. 1053 - "The Realm of Galaxies"
4. 1920 - "Satellites are Falling"
5. 980 - "What Do We See in the Sky"

Evaluation:

As a culminating activity to evaluate the effectiveness of the unit, plan a "Solar Systems Day". Set up at stations around the room and on the blackboard, problems which require the students to perform the activities listed under Objectives. Call students, three at a time, to work the problem. (Students of same ability level should be pitted against each other) Time the students; first one finished receives 10 points, second, 5 points, third, no points. (Students should be given areas to be covered a few days in advance so that they can study.) Examples of problems include:

1. Write in the names of the planets on a diagram of our solar system.
2. Calculate the distance light travels in a year.
3. Explain the causes for the action of a pendulum.

4. Calculate how long it will take to reach Mars (given distance and speed).
5. Name the constellations pictured.
6. Demonstrate the phases of the moon.
7. Calculate the speed of the earth's rotation.
8. Explain how the temperature of stars is measured and list, in order (from coolest to hottest), the three kinds of stars.

Unit III Career Exploration

Science: Chemistry

Purpose: To become acquainted with the physical and chemical properties of matter, and to help the student become skillful in the use of chemical symbols, formulas, and the writing of equations

Objectives: Upon completion of the work in this unit, the student should be able to:

1. Observe and state physical properties of materials.
2. Identify the physical properties of metal.
3. Identify the metallic ions in pure metal or in compounds of metal.
4. Be able to understand and use the periodic table effectivel
5. Identify and build models of atoms.
6. Be able to write and balance chemical equations.

Activities: To accomplish the objectives, the students may engage in activities such as:

1. Provide each student with a list of physical properties similar to the one below. Give an example of each. Have students add to the list.

Color	1.	Carbon is black
	2.	
	3.	
Odor	1.	Ammonia has a sharp odor
	2.	
	3.	
Texture	1.	Sodium hydroxide is slippery
	2.	
	3.	
Taste	1.	Sodium chloride is salty
	2.	
	3.	
Density	1.	Mercury is very dense
	2.	
	3.	
Solubility		
	1.	Potassium oxide is very soluble in water.
	2.	
	3.	

Provide each student with a list of physical states of matter similar to the one below. Give an example of each. Have stud add to the list.

Liquid------------1. water
2.
3.

Gas---------------1. methane
2.
3.

solid-------------1. iron
2.
3.

solution----------1. salt in water
2.
3.

suspension--------1. mud in water
2.
3.

2. Have the students work in groups and conduct a series of experiments on the physical properties of metals. Give each group a list of the following physical properties of metal. Let them decide how they wish to demonstrate or identify each of the properties.

(a) luster
(b) tarnish
(c) tensile
(d) malleability
(e) ductility
(f) conductivity
(g) magnetism (a property of certain metals)

Flame tests are used to identify the metallic ions in pure metal or in compounds of the metal. Put some of the following chemicals in the flame of a Bunsen burner so that students may observe and associate the color of the flame with each element.

Note: If pure elements are not available as listed, compounds may be substituted. Example: sodium cloride for sodium

(a) sodium
(b) potassium
(c) strontium
(d) lithium
(e) calcium
(f) barium
(g) copper

3. The Periodic Table

Give the students a list of elements and have them find each one on the periodic table. Students should record atomic number, and atomic weight for each element given. This list should be kept in notebooks in preparation for Activity IV and Activity V.

4. Determining Atomic-Numbers and Atomic Weights.

1. Provide each student with the following information.

The atomic number of an element is equal to the number of protons in the nucleus of one of its atoms. Protons and neutrons have almost equal masses. The sum of the masses or weights of the protons and neutrons in the nucleus gives the atomic mass or atomic weight of an atom.

2. Make a chart of elements similar to the one below:

Name of Element	No. of Protons	No. of Neutrons	No. of Electrons	Atomic Number	Atomic Weight
Hydrogen	1	0	1	1	1
Helium					
Lithium					
Carbon					
Calcium					

List the metallic elements separately from the non-metallic elements

5. Provide the students with materials suitable for making atom-models. If atom-model kits or tinker toy sets for making models are available, group the students and have them put together models of different atoms. Color the pieces representing the protons, neutrons, and electrons differently so that the structure of the atom can be seen. Make drawings of the different models in notebooks. Save atomic models for the next experiment.

3. With the aid of the Periodic Table, students should fill in the chart.

6. Formula-writing

Supply the students with different colored spongy objects, each representing an element, and straight pins. Combine the colored objects to form compounds and chemical formulas.

Write the formulas.
Crisscross the valences as shown in the example below.

Example: Magnesium and Chlorine

Step 1. Mg^{2} Cl^{-1}
Step 2. Crisscross the Valences

Mg^{2} Cl^{-1}

Mg^{1} Cl_{2}

Step 3. $MgCl_{2}$

7. Field Trip. Visit a chemistry laboratory, so that the students may observe a chemist at work. Give students specific things to look for prior to the trip.

Careers in Chemistry

Chemistry offers many different occupational opportunities, especially in the chemical industry. Outside of the chemical industry, many chemists work in the areas of food, plant, and soil chemistry. Nurses require some knowledga of chemistry. Pharmacists and Laboratory Technicians must have a thorough background in chemistry. All medical careers require a study of chemistry.

Materials: Books for Students and Teachers

1. Oxen, Joseph M. Pathways in Science: Chemistry of Metals. New York, 1971.

2. Blanc Sam S., Fischler, A. and Cardner, O. Modern Science: Matter, Energy and Space. New York, 1971.

Films

1. 1483 "Chemical Bonding"
2. 1328 "Materials of Our World"
3. 1860 "Elements, Compounds and Mixtures"

Evaluation:

1. Provide samples of various materials. Have students identify each by observing its physical property.
2. Given a list of substances, students should identify each as liquid, gas, solid, solution, or suspension.
3. Divide the class into two teams. Have a contest using the elements. Name the element; give one point for each of the following: symbol, atomic number, atomic weight, number of protons, number of neutrons, number of electrons. Members

Evaluation cont.

(3) cont.

of team with the highest score at the end of the period will receive a bonus of ten points to be used on the unit test.

4. Have a written test.

Unit III. Career Exploration

Science: Earth Science

Purpose: To introduce the student to the questions and problems that face the earth scientist and challenge him to exercise his ingenuity and perseverance in finding possible answers.

Objectives: Upon completion of the work in this unit, the student should be able to:

1. Understand how the new evidence made available through space exploration added to man's knowledge of the shape of the earth.
2. Show how the dimensions of the earth were determined.
3. Discuss the composition of rocks.
4. Examine, describe, and classify soils.
5. Discuss sedimentation, salt dissolving, and erosion.
6. Explain the mantle and the core of the earth.

Activities: To accomplish the objectives the students may engage in activities such as:

1. Make available pictures of the earth taken from satellite and have the students note the curved horizon. Discuss how and why man's views concerning the shape of the earth have changed throughout history.
2. Have the students determine the volume of a ball or some other sphere.

$$\frac{\text{Radius of}}{\text{Sphere}} = \frac{\text{Circumference}}{2}$$

   (a) Have the students determine the mass of the ball sphere.
   (b) Calculate the density of their ball.

$$\text{Density} = \frac{\text{mass}}{\text{Volume}}$$

3. Composition of rocks and minerals: Obtain a few rocks, a hammer, some sandpaper, and magnifying glasses.

Have the students break off some pieces from the rocks with the hammer, or rub the rocks with a steel file or sand paper. Use the lens to examine the surface of the rock. List as many characteristics as possible for the grains in each rock. Give students those characteristics which identify mineral crystals; see how many of these students can locate in their rock samples.

4. Soil

Encourage each student to bring in at least three or four different soil samples for investigation. Baby food jars make excellent containers for collecting and storing soil samples. Some students may be interested in actually making some soil. Rocks can be broken down and organic matter and water added.

5. Demonstrating three earth processes.

Encourage students to set up models illustrating sedimentation, salt dissolving, and erosion. Annual Nile flooding and corresponding build-up of a flood plain might be illustrated with an inclined stream table. Salt dissolving and erosion could be treated similarly in a system in which water would be wearing away a mass of land.

6. The Earth's Crust.

The crust, mantle, and core make up the lithosphere. The earth's crust is composed primarily of two igneous rocks, granite and basalt. Try to get examples of basalt and granite so that students can measure and compare the density of each. Basalt is a fine grained, dark-colored rock consisting of visible grains of quartz (clear or glassy), feldspar (white or pink, often chalky, with flat surfaces), and minor amounts of dark minerals (black mica or horn blende).

7. The Mantle and the Core

Use the "black box" approach, in which observations can be made only from outside the box and the student cannot open the box to verify his interpretations. Construct "black boxes" for students using rocks of different composition and density, solid vs. liquids, heated and cold water for convection currents, magnetic objects. etc.

8. The Theory of Isostasy

Have the students use an aquarium tank and blocks of different density to demonstrate the theory of isostasy. The blocks should sink to different depths and extend to different heights above the surface of the water. Place weights on tone block. It sinks deeper and the other blocks rise. Compare the balance on the aquarium to the isostatic balance of materials in the earth's crust.

Integrated Activities

Have students demonstrate the following:

1. Show the reactions of rocks to different kinds of stress by using soft plastic clay.
2. Construct and demonstrate a Seismograph.
3. Measure magnetic declination and inclination.
4. Show the various states of transition from a young mountain to an old mountain. (Using clay)
5. Make a panorama model or a model of one section of the ocean deep: show plains, canyons, mountains, valleys, rises, and depression.
6. Have students debate the advantages vs. disadvantages of volcanic activities (damage to life and property vs. some of the richest ore deposits, best building material, and most fertile soils).

Careers in Geology

Geologists are employed by State and National Geological Surveys, which carry on detailed investigations. Other geologists teach in universities, work for the city water departments, and in oil and mining companies.

Other related careers are:

Soil Conservationists, Oceanographers, Archaeologists, Agricultural Engineers, Crop and Soil Scientists.

Enrichment Materials

Materials:

1. Books:

Blanc, Sam and Fischler. Modern Science: Earth, Matter, & Space. New York, 1967.

Bishop, Margaret, Lewis, Phyllis Focus on Earth Science. Columbus, 1969.

Nemowitz, S. and Stone, D. Earth Science: The World We Live In. New York, 1969.

Jacobson, W., Kleinman, G. Inquiry Into Earth and Space Science. New York, 1969.

2. Films

1647	"Earth, The - Resources in its Crust."
917	"Minerals and Rocks - Stones of the Earth."
1542	"Rocks that Form on the Earth's Surface."
1699	"Shape of the Earth - The Geodesy."
582	"What Is Soil?"

Evaluation:

Evaluate by administering a written test.

Unit III. Career Exploration

Science: Physics (Forces and Motion)

Purpose: To teach Physical Science concepts to students in such a way that they learn through their own experiences.

Objectives: Upon completion of work in this unit, the student should be able to:

1. Describe how the force of gravity affects the rate of motion of a falling object.
2. Demonstrate that the mass of a falling object does not affect its acceleration of motion.
3. List some factors in the environment that might affect the rate of motion of a falling object.
4. Find the center of gravity of a flat, irregularly-shaped object.
5. Calculate the coefficient of friction of sliding and rolling friction.

Activities: To accomplish the objectives, the students may engage in activities such as:

1. Observing falling objects.

A force is a push or pull which affects the motion of matter. All motion is caused by force, but not all forces produce motion.

Gravity is a force that produces motion. Careful experiments have shown that the speed with which an object falls from a given height is the same regardless of mass. If one drops a feather and a coin from the same height, the coin strikes the ground first. The feather is held back by the amount of air that must be pushed aside to let it fall.

Both of the above concepts may be demonstrated by the students in class. Provide a pair of long glass tubes with stoppers. Place inside one tube a small feather and a coin. Stop up both ends with solid stoppers. Hold the tube in a vertical position and quickly invert it and observe the feather and coin as they fall.

Do the same thing with the other tube except, insert a one hole stopper in one end equipped with glass tubing. Remove the air from the tube with vacuum pump. Observe the falling objects.

2. Center of gravity:

The center of gravity is a point in an object at which its weight appears to be concentrated. Provide for the students plenty of cardboard, a pair of scissors, a piece of string, a pin, and a small weight and tell them to cut several different shapes. Fasten the string with a small weight attached to the pin and let it hang free. Make a mark along the path of the string. Hang the cardboard from another edge and make a second mark along the path of the string. Hang it from a third. This method should help the students find the center of gravity of irregularly shaped objects.

Repeat this experiment using an empty milk carton. Place the carton on the cover of a book. Lift the cover of the book slowly putting your finger against the bottom of the carton to keep it from sliding off. To find why the carton tips over attach a string with a weight high on the carton. Repeat the process and observe the position of the string. Fill the carton one-fourth full of sand and repeat the experiment. The students should observe a change in the center of gravity.

3. Friction:

Friction is a force that opposes motion. The force that offers resistance to motion between two rubbing surfaces is called friction. The amount of friction produced on different kinds of surfaces can be found.

Have the students to compare mathematically the friction between different surfaces. Make available for the students blocks of wood.

They must experiment and collect data in order to find the coefficient of friction. ($C_f = \frac{F}{N}$) F is the force needed to overcome friction.
N is the weight of the object. The following example might be helpful to the student.

Example: Find the coefficient of friction if a wood block weighs 5 pounds and a force of 2 pounds is needed to keep it sliding at a steady rate.
Solution.

1. $C_f = \frac{F}{N}$
2. $C_f = \frac{2}{5}$
3. $C_f = 0.4$

There are two main kinds of friction. (1) sliding friction, when an object is pulled or dragged across a surface; and (2) rolling friction when a wheel or ball rolls across a surface. Sliding friction was demonstrated in Activity 3.

Have the students experiment with rolling friction and find the coefficient of friction.

4. Acceleration

Acceleration is the rate of change of velocity. With the help of a 5 or 6 ft. board, golf ball, and a clock with a second hand, the students should be able to find the final velocity of an object starting from rest. Mark the side of the board in 1 foot intervals. By testing, raise one end of the board so that a ball, from rest, will roll one foot in one second. Have a student watch the second hand on a watch or clock and give the signal to let the ball start rolling from the raised end to obtain average measurements. This is an example of uniformly accelerated motion.

With the help of this formula $V_f = V_i$ & (a x t), have the students to predict the final velocity of objects with positive accelerations. V_f = final velocity: V_i = initial velocity; a = acceleration; t = time that it has traveled in seconds.

The following example might be helpful to the students.

Example: Find the final velocity of a ball starting from rest and rolling down a board with an acceleration of 4 feet/sec^2 after 10 seconds have elapsed.

Solution:

1. $V_f = V_i$ & (a x t)
2. $V_f = 0$ & (4 x 10)
3. V_f = 20 feet/sec^2

Integrated Student Activities

1. Have the students to draw a vector to represent the size and direction of a force.
2. Demonstrate and explain why pressure is greater at lower depths of columns of solid or liquid materials.
3. Calculate the downward pressure of a liquid when the density and the depth is known.

Careers in Physics

Employment opportunities for Physicists are almost unlimited. The need for Physicists in industry, teaching, and research is much greater than the supply of trained men and women.

Some Physicists conduct experiments and work with instruments and other equipment. Many work in Applied Physics, or fields directly related to improving a manufacturing process or the company's product.

Other related careers are: Physics Technicians, Nuclear Engineers, X-Ray Technicians.

Materials:

1. Books for teachers:

   Oxenhorn, Joseph, Idelson, Machael. Pathways in Science: The Forces of Nature. New York. 1968.

   Carter, Joseph; Bajema, Paul Physical Science: A Problem Solving Approach. Boston, 1971

   Taffel, Alexander, Physics Its Methods and Meanings. Bost 1965.

   Blanc, Sam Modern Science Matter, Energy and Space, New York, 1971.

2. Films

   1657 "Force of Gravity"
   1502 "Forces"
   1969 "What Is Uniform Motion"

Evaluation:

1. Evaluate Objectives # 1, 2, 3, and 5 by giving a written test.
2. Evaluate Objective # 4 in the following manner.
   Give students five flat, irregularly-shaped objects. Students should find the center of gravity of each.

Unit I Awareness

Social Studies

Purposes:

1. To make the students aware that each of us is a separate and unique individual.
2. To make each student stop and take stock of himself/hersel socially, mentally, and educationally
3. To point out the factors that are involved in making intelligent occupational choices

Objectives:

1. Throughout this unit the student should be able to participate actively in classroom planning and implementation of those plans
2. Upon completion of work in this unit, the student should be able to:
   a. List and discuss orally the eight basic needs of man.
   b. Write an in-depth autobiography describing his strengths, weaknesses, and goals.
   c. Critically analyze his education up to this point and determine future educational needs based upon tentative career choices.
   d. Differentiate between and evaluate various occupations based on personal suitability (e.g. working out-of-doors vs. working indoors, working alone vs. working with others).

NOTE: In the ninth grade, the following courses are offered:

World Civilization, Civics, Climatic Geography and Afro-American History, All students will take one or more of these courses. Since some of the activities in this unit are applicable only to a specific subject, while others are applicable to all; the following symbols are used for identification of specific activities: World Civilization (W), Civics (C), Climatic Geography (G), Afro-American History (A/A), all (Z).

Activities:

To accomplish the objectives, the students, may engage in the following activities:

1. All students will take two tests: a personality test and a occupational preference test (Z).
2. Based on the personality test and the occupational preference test, each student will prepare a notebook or scrapbook using

pictures, job descriptions, and requirements of several occupations that he might desire and for which he feels suited(Z).

3. List and discuss the basic needs of man. Compare how we meet these needs with how these needs are met in a more primitive culture (W), a different climatic region (G), or among different ethnic groups (C) (A/A) one or more of the following might also be used:

    a. Art Work - posters can be a made by the students - (individual quests).
    b. Film strips
    c. Skits - written and acted out by the students - (Group quests

4. Discuss the following factors that go into making an individual unique (Z):

    a. Mental ability
    b. Special aptitudes
    c. Interests and goals
    d. Physical traits
    e. Social traits

5. Individual quest: Report on outstanding individuals who became successful in spite of such things as prejudice, poverty, or severe handicaps (C); (A/A - use an outstanding Black for the report).

6. Group quest: Discuss the following question after individual reports: What other factors go into making an individual? The group may report orally or make a bulletin board (C) (A/A).

7. Through art (posters, pictures, etc.) and/or through skits, examine the class and caste systems of various countries (e.g., India) and try to determine if it is possible to overcome this type of automatic placement (G).

8. Written assignment: Are we masters of our own destinies? (Z)

9. Individual quest: Determine the answers to the following questions and present to class (Z):

    a. Why do people work?
    b. How does one's job affect his life style?
    c. How do workers affect a nation?

10. Class quest: Interview students outside of the class on the following questions: "What are our needs? Is our school meeting these needs?" If the survey shows that the majority of the students interviewed do not feel that their needs are being met, the class will suggest ways that these needs can be met (C).

Vocabulary:

1. Mental
2. Destiny
3. Physical
4. Preference
5. Indicators
6. Intelligence quotient
7. Aptitude
8. Trait
9. Competence
10. Goal
11. Unique
12. Caste
13. Class system
14. Culture
15. Environment
16. Basic Needs (food, clothing, shelter, government, education, religion, recreation, and love and acceptance.

Evaluation:

1. Administer written test on the eight basic needs of man.
2. Use the in-depth autobiography (see Objective 2b) as a means of evaluating students' abilities to critically and objectively judge themselves.
3. Through planned discussions (panel, symposium, debate) have small groups present their views on the education, necessary personal characteristics, etc. for various occupations.

Unit II Communications

Social Studies

Purposes:

1. To make the students aware that we live in an interdependent and inter-related world and that communication among the many people of the earth benefits all.
2. To make the students aware that understanding is a vital part of communication.
3. To review the previous Career Development Survey Experience with an emphasis on communication.

Objectives: Upon completion of this unit, the students should be able to:

1. Use a world map to show through words, picture and/or symbols what goods are exchanged between the United States and other countries.
2. Discuss orally world problems with an understanding of how cultural and religious beliefs affect the solution (i.e. lack of food in India while cattle roam the streets).
3. Demonstrate in writing, orally, and through skits, how communication is a vital part of all ten career clusters.

Activities: To accomplish the objectives, the students may engage in activities such as the following:

1. Review the basic needs of man showing the role that communication plays in meeting these needs. (Z) Use:
    a. Film strips
    b. Pictures in text books
    c. Posters made by students

2. Map work - Students will find and show on a world map the countries from which the U.S. gets many vital products. (G)

    a. Use a large wall map on which students may place cutouts of various products in the appropriate country.
    b. Using outline maps, have each student make smaller versions of a which he may keep in his notebook
    c. Written work - Have students write short essay answers to questions concerning trade. Examples follow:
        1. What if all international trade ended?
        2. Has our backing of Israel affected our oil supply?
        3. Why did the U.S. have to depart from Washington's policy of isolationism?

    (Care should be taken to see that questions are current.)

3. Individual quest: Prepare a picture showing how the communication satellite has tied the world together through T.V. (C), (G)

4. Make one or more of the following research assignments. (Enlist the librarian's aid in helping students to find materials).

   a. Read old newspapers and magazine articles showing how the Union of South Africa's apartheid policy has affected international athletic events and write a brief report. (C), (G), (A/A)

   b. Individual quest: Through art work show how a totalitarian country does not allow the free exchange of ideas or a student who writes well can report or "Why a totalitarian country can not allow the free exchange of ideas." (C)

   c. Map work: On a world map show through symbols where the U.S. has sent members of the Peace Corps. (C), (G)

   d. Related Activites (to C): Class discussion - "Why was the Peace Corps established?"
   Class quest - "Has the Peace Corps been effective?" (This can be shown through newspaper and magazine articles obtained from the library).

5. Have students participate in informal debates on current national and international topics of interest. For example: "The disclosure of the Watergate scandal has done more harm than good for the U.S., both nationally and internationally. (C) (G).

6. After viewing films, listening to records, and reading about the August 28, 1963 March on Washington, a student will make an oral report on the "Role of Communication in the Civil Rights Movement."

7. Another student (or the whole class) will make written reports on the "Role of the Communications Media in the Watergate Scandal".

8. Individual quests: How has transportations tied the world and/or country together? (Z)

   a. Using popcicle sticks, a U.S. map, and illustrations, a student can show the joining of the first transcontinental railroad.

   b. Using a map and string, a student can show international airplane routes.

9. Research the interchange among countries of experts in agriculture nutrition, medicine, transportation, and construction. (Z) Use role playing to show some of the problems which might develop.

   a. Show how a nutrition expert sent to India must have knowledge of the religious beliefs of the people.

   b. Try to convince a Masai in East Africa that his cattle are causing erosion, when he considers cattle a sign of wealth

c. Try to immunize the children of South American tribesmen far up the Amazon who fear the hypodermic needle.

10. Portray the change in the image of the Negro on T.V. and in the movies during the past ten years through role playing. (C), (A/A)

11. Name T.V. programs on today that perpetuate sterotypes and myths about the Negro, Indian, Oriental, Italian, and Irishman. Discuss these sterotypes.
    a. How or why did they develop?
    b. Why, in view of the changes (see 10) made, do these sterotypes persist?
    c. Are they still offensive to a vast majority of people?

12. Debate a topic such as Marlon Brando's refusal of the Oscar.

13. Using posters, show methods that advertisers employ in order to sell their products.

14. Research the role of the newspaper and T.V. in Presidential electi
    a. Individual quest: Report on why it has been said that T.V. elected Kennedy.

    b. Individual quest: How did presidential candidates gain national attention before T.V.?

    c. Individual quest: Would it be difficult for a poor man lik Lincoln to become President today?

Materials:

Books:

1. Exploring the Urban World. O'Conner
2. Eyewitness: The Negro in America. Katz
3. Your Life as a Citizen. Tiegre
4. The Afro-American in U.S. History. DaSilva
5. The World Around Us. Thralls

Films and Records (March on Washington)

Vocabulary:

1. Culture
2. Religion
3. Environment
4. Communication
5. Isolationism
6. Satellite
7. Similar
8. Climatic region (G)
9. Rainforest (G)
10. Semitropical (G)
11. Moist
12. Marine (G)
13. Polar (G)
14. Sterotype
15. Myth
16. Education (Means different things in different cultu

Evaluation:

1. Provide students with outline maps of the world and lists or cut-outs of various products exchanged between the U.S. and other countries. Students should be able to place each product in the correct country.
2. Have students write short essays (length determined by ability of class) on topics such as the following:
    - a. Cultural Beliefs and World Problems
    - b. National Affairs Have International Repercussions
    - c. Our Shrinking World
    - d. The Shrinking U.S. of A.
    - e. The Decline and Fall of the W.A.S.P. T.V. Empire
    - f. Media Mania - Some Causes and Effects
3. Administer written test based on specific material taught in each course.

Unit III - Exploration

Social Studies: Afro-American History

Purposes: 1. To provide students with the opportunity to explore specific careers relating to a study of Afro-American History.

2. To explore the many contributions that Blacks have made to this country.

Objectives: Throughout this unit, the student should be able to:

1. Show through art, posters, pictures, displays, oral and written work on in-depth exploration of one or more of the following fields:

   athletics
   literature
   fashion design
   drama
   music
   science

2. Trace through a time line outstanding contributions of Blacks in music, art, science, fashion, sports, and drama.

3. State specific laws, amendments and count decisions that have improved the life of the Black in America.

Activities: In order to accomplish these objectives the students may engage in the following activities:

1. Sports

   a. Prepare a poster showing outstanding Blacks in boxing from Jack Johnson to George Foreman. Label each boxer. Research the lives of these men noting similarities and differences.

      1. Jack Johnson
      2. Jersey Joe Walcott
      3. Joe Louis
      4. Sugar Ray Robinson
      5. Muhammad Ali
      6. Joe Frazier
      7. Ken Norton
      8. George Foreman

   b. Using newspaper and magazine articles, prepare a scrapbook of one or all of the following outstanding baseball players:

      1. Willie Mays
      2. Hank Aaron
      3. Jackie Robinson
      4. Bob Gibson
      5. Satchel Paige
      6. Vida Blue
      7. Roberto Clemente
      8. Willie Stargell
      9. Richie Allen

c. Research basketball players such as: Jabar, Bill Russell, Wilt Chamberlain, Walt Frazier, Elgin Baylor, Oscar Robinson, David Bing, and Austin Carr. Search for pictures of these players and report on the following:

   1. Height
   2. Weight
   3. Educational background
   4. Outstanding contribution or interests outside of sports
   5. Team
   6. Salary

d. Research football players such as: Larry Brown, Jim Brown, Gale Sayers, Willie Galiomore, Paul Warfield and Bob Hayes. Search for pictures of these players and report on the following:

   1. Height
   2. Weight
   3. Educational background
   4. Team
   5. Salary
   6. Outstanding contribution or interests outside of sports.

e. Research outstanding Blacks in tennis, track and golf. Prepare posters labeling players giving educational background, and general salary.

2. Media: Students who are interested in the Media may choose news, music, literature, the theater, or art. There are many careers that can be researched such as:

   1. Motion picture projectionist
   2. Disc jockey
   3. Radio and television announcer
   4. Theater manager
   5. News commentator
   6. Writer
   7. Critic
   8. Comedian
   9. Photographer
   10. Director
   11. Producer
   12. Actor
   13. Musician
   14. Singer
   15. Artist
   16. Dancer

The students may engage in the following activities:

1. Research the lives and careers of men such as:

   Isaac Hayes, Curtis Mayfield, and James Brown for information regarding;
   - a. Previous occupation
   - b. Years in the business
   - c. Educational background
   - d. Opinion on education
   - e. Interest outside of music

2. On a poster trace the history of Motown Enterprises and Barry Gordy, Jr.

3. Individual Quests:

   a. Oral reports on such people as Marion Anderson, Stevie Wonder, Ray Charles, Billie Holliday.
   b. Research Blacks who have been successful in music which led to film careers, i.e. Diana Ross, Harry Belefonte, Jim Brown, and Rosey Grier.

4. Write letters to outstanding Black artists such as:

   a. Sidney Poitier
   b. Raymond St. Jacques
   c. Diana Ross
   d. Cicely Tyson
   e. Ron O'Neil
   f. Richard Roundtree
   g. Billie D. Williams

5. Individual quest: Act as a disc jockey and trace Black music from the 1920's to the 1970's.

6. After listening to Nikki Giovani's "Truth Is on its Way", the students will write poems that they feel portray the life of a typical Black man today.

7. Make a poster listing outstanding books and or plays by Blacks and the authors.

8. Group quest: Write, direct, advertise, and act out a play.

9. Group quest: Write and act out a mock T.V. variety show. Talent in singing, dancing, and comedy can be displayed. The video tape machine can be used.

10. Prepare a scrapbook following the careers of such Black groups as: The Jackson Five, The Temptations and The Supremes.

3. **Science:** Students who are interested in careers in science or medicine may research the following careers:

   a. Atomic energy techinician
   b. Dental technician
   c. Dentist
   d. Medical record librarian
   e. Medical technologist
   f. Optical mechanic
   g. Optician
   h. Physics technician
   i. X-ray technician
   j. Chemical engineer
   k. Nuclear engineer
   l. Nurse
   m. Physician
   n. Pharmacist
   o. Podiatrist
   p. Optometrist
   q. Medical social worker
   r. Physical therapist

   1. Make a poster displaying outstanding Blacks in Science such as: George Washington Carver, Daniel William, and Charles Drew.
   2. Trace the history of Black medical institutions such as: Meharry and Howard University Hospital.

4. **Fashion:**

   a. Through pictures, trace the African influence seen in hair and clothing styles today.
   b. Design a male and female outfit that reflect our African heritage.

5. **Law:** Students interested in law may research the following careers:

   a. Judge
   b. Lawyer
   c. Legal secretar[illegible]
   d. Political sci[illegible]st
   e. Court stenographer

   1. Role play a school situation comparing two Supreme Court Decisions such as "Plessy vs. Ferguson" and "Brown vs. Board of Education of Topeka."

2. Mock Supreme Court case on issues such as:

   a. A couple being denied housing based on race.
   b. Black children being denied entrance to a playground.
   c. A Black person beaten up while policemen stand by.

3. Prepare a chart of Civil Rights legislation from the 13th Amendment to the Civil Rights Act of 1974.

4. Research the life of Thurgood Marshall.

Evaluation:

1. Given the names of famous Black Americans, students will be asked to place them in the correct career with 70% accuracy.

2. On a time line placed around the room, students will be asked to place pictures of Blacks who have made outstanding contributions in various fields. Students will also be given short statements of significant events in Black American history to place correctly. Each student who places a picture or statement, must tell something about the person or explain the statement.

Unit III - Exploration

Social Studies: Civics

Purposes:

1. To make the students aware of the advantages and responsibilities of citizens living in a democratic country.
2. To make students aware of the opportunities in the world of work and help him develop career consciousness while he explores his rights and duties as a young citizen.

Objectives: At the end of this unit the student will have explored:

1. The Constitution - its development and contents
2. The plan of the Federal Government.
3. Why government is necessary
4. A comparison of various types of governments
5. The working of state and local governments
6. The history and development of Washington, D.C.
   a. Governmental, educational, and cultural centers
      1. Mayor's Office
      2. City Council
      3. Board of Education
      4. Impact of Home Rule
      5. House & Senate D.C. Committees

   b. Related Careers observed
      1. Diplomatic
      2. Law
      3. Politics
      4. Fine Arts
      5. Protection Services
      6. Education
      7. Commercial
      8. Multi-Media

   c. History and development of the Federal City

Activities: In order to accomplish these objectives, the students may engage in the following activities:

1. Creative expression through short stories, poetry and essays dealing with issues of the time such as war, poverty, pollution, waste of human and natural resources. Every student can participate regardless of the level of his creative talent.

2. Narrative accompanied by transparencies, slides, pictures, posters, music, etc. to give summation or overview of a particular unit, issue, or topic. Again the student will gather material from magazines, libraries resource rooms or make them himself.

3. Search the newspapers for articles concerning the various services- what they are, who benefits, where and how to get them.

4. Visit the Department of Human Resources and/or have someone from this department to visit the class.

5. Where possible, use the P.A. system in the building to tune in on programs- news or otherwise that will fit in with units or classroom activities.

6. Depend heavily on the daily papers to augment classroom activities. (Use the services of Mr. Davis of the Washington Post School Services.)

7. Use the services of Officer Friendly to study the protective services of the Police Department.

Evaluation:

1. Use a written test to see if students are able to identify the three branches of government and the parts of the Constitution.
2. Use a short answer quiz to see if students know how the need for a new written plan of government was made evident and what was done about it.
3. Divide the class into two groups and have a debate which will show students' awareness of the different types of government. Students should also be able to compare a democratic form of government with a communistic form of government.
4. Using a list of thought questions, have students engage in a discussion which will demonstrate whether or not they have the concept of why government is necessary and what government does and each citizen's role in government.
5. Have a short written quiz on the offices and officers of the D.C. Government.

6. Have an oral quiz on the role of the U.S. Senate and House in running the D.C. Government.
7. Give a fifty item test at the end of the unit on the history and development of Washington, D.C.

Unit III - Exploration

Social Studies: World Civilization

Purpose:
1. To provide the students with the opportunity to explore specific careers relating to a study of World Civilizations.
2. To show the close relationship between the past, the present, and the future.

Objectives: Throughout this unit, the student should be able to:

1. Show through posters, pictures, displays, oral and written work an in-depth exploration of one of the following fields; Archaeology, Drama, Fashion Design, Religion, Social Work, Housing and Political Science.
2. Display through art work, the major achievements of man from pre-history to modern times.
3. Through a time line, trace the major architectural designs.
4. Compare the early major religions with those of today and state reasons why some religions endured while others did not.
5. List reasons for the development of cities and explain, why most civilizations developed around rivers.
6. List and compare orally the major forms of government.

Activities: In order to accomplish these objectives, the students may engage in the following:

1. Archaeology:

   a. Compare man of the Neolithic, Paleolithic, and Metal periods regarding their:

      1. Years on earth
      2. Geographic location
      3. Method of securing food and clothing
      4. Type of homes
      5. Skills
      6. Religion
      7. Tools used
      8. Government
      9. Most important discovery

   b. List the implements used from pre-history up to modern times.
   c. Compare the early Egyptian, Greek, and Roman civilizations through art work and pictures. Include such information as their:

      1. Years of glory
      2. Geographic location
      3. Type of government
      4. Major rules
      5. Major contributions in drama, art, and literature

6. Religion
7. Tools

d. Prepare a scrapbook of the early inhabitants of Asia. Find pictures which show the physical features of these diffarent peoples, their villages, major art, and crafts.
e. Construct a typical manor of feudal Europe.
f. List the ways in which the Crusades led to the "new birth of learning" and the discovery of America.

2. Drama:

a. Prepare a chart tracing world drama from 500 B.C. to the A.D. 400:

DATES	GREECE	
500 B C to 200 B C	Tragedy Aeachylus Sophocles Euripides	Old Comedy Aristophanes New Comedy Menander
	ROME	INDIA
200 B C to AD 400	Tragedy Seneca Comedy Plautus Terence	Natyasastra Kalidasa

b. Cite reasons why drama almost disappeared from 400 to 900.

c. Individual Quests - Students may prepare:

1. A written and oral report on English drama during the Elizabethan Age.
2. A scrapbook on "The Life and Works of William Shakespeare".
3. A chart comparing English, Spanish, and French drama from the 1500's to the 1600's.
4. A written and oral report on "The Role of the Male in the Early Theatre".

d. Prepare a poster tracing drama from 900 to the 1700's.

Dates	England	France	Oriental
900 to 1500	Religious	Plays	Beginning of chinese Drama
1500's	Elizabethan Drama Marlowe Lyly Shakespeare Jonson	Establishment Of Acting Companies in Paris	The "no" theater originates in Japan
1600's	Stuart Drama Jonson, Webster, Beaumont, Fletcher Theaters closed in 1642 Restoration Drama Theaters reopen in 1660 Comedy Etherege, Congreve Tragedy Otwig, Dryden	Neoclassical Drama Tragedy Corneille Racine Comedy Moliere	Development of doll and Kabuki theater in Japan
1700's	Comedy Steele, Gay, Goldsmith Sheridon Tragedy Lillo	Tragedy Voltaire, Dideast Comedy Marivoux Beaumaichais	

e. Prepare a scrapbook tracing the history of Oriental drama.

3. Fashion Design:

   a. Construct a display comparing the fashions of the Egyptians, Greeks, and the Romans with those of today.

   b. Report orally on the use of cosmetics from ancient Egypt to modern times.

   c. Prepare a chart showing the different types of materials used in the production of clothing from ancient Egypt to modern times.

4. Religion:

   a. List reasons why early man worshipped such things as the sun, moon, wind, etc., while modern man generally does not.

   b. Research the religious practices of the ancient Egyptians. Report on these practices and what the pyramids have shown about their beliefs about life after death.

   c. Report on the major Greek and Roman gods and the powers attributed to these gods.

   d. Trace the rise of Christianity in the Middle East and Europe.

   e. Report on the corrupt religious practices of the Roman Catholic Church during the Middle Ages and show how this led to the Reformation.

   f. Research the major Asian religions and show how these religions affect the lives of the people.

   g. Trace the rise of Islan and examine their "five oral sword" philosophy.

5. Social Work:

   a. Report on the social class structure of each period for information on:

      1. Social classes
      2. Class mobility
      3. Interaction between the various classes

   b. Research and report on the specific laws and movements that have led to a relaxation of strict class systems in most countries today.

6. Housing:

   a. Report on "Why Practically All Civilizations Have Developed Originally around Rivers".

   b. Construct a model of a typical early city showing the importance of walls.

   c. Through art, give examples of, and show the differences between Greek, Roman, Byzantine, Romanesque, and Gothic architectu

   d. Report orally on how the creation of cities have led to problem of disease, plagues, crime, and pollution.

7. Political Science:

   a. Make a chart comparing the governments of Egypt, Rome, and Greece.

   b. Compare orally Greek and U.S. Democracy.

   c. Role play the government of feudal Europe:

      1. King
      2. Nobleman
      3. Peasant
      4. Clergy

   d. Report on the differences between the early governments of China and Japan.

   e. Compare the major totalitarian governments of Fascism, Nazism, and Communism regarding their:

      1. Main idealogy
      2. Controllers of power
      3. Practices

Evaluation:

1. Students' pictures, posters, oral, and written reports will be used to evaluate his in-depth knowledge of the field he selected to explo

2. From the major achievements of man from pre-history to modern times select the one which you think has benefited man most, and in an essay of about one page, explain why. Do the same for the one which you feel has benefitted man leest.

3. Prepare a debate on the major forms of government. Students will be expected to give factual information rather than opinions.

4. Throughout the unit, short written quizzes will be given to test students' retention.

Unit III - Exploration

Social Studies: World Geography

Purpose: To Provide the students with the opportunity to explore specific careers relating to a study of World Geography.

Objectives: Upon completion of this unit students should:

1. Have an understanding of the interdependence of the people of the world.
2. Have an understanding of the relationship of the natural resources of a nation to its development.
3. Be familiar with the location of the major countries of the world; be able to recognize the physical features that are important to man; and, know why such physical features as plains, mountains, and rivers are important.
4. Know how climate, natural resources, and physical features play a part in determining the occupations and life styles of people.
5. Have a working knowledge of longitude and latitude as a location help.
6. Explore, through art, posters, displays, oral and written work, the following fields; Social Work, Agriculture, Topography, and Meteorology.

Activities: In order to accomplish these objectives, students may engage in the following activities;

1. Divide students into nine groups. Each group will research and report on the different type of people found in one of the nine climatic regions. Reports should include such information as:
    a. Type of people
    b. Major religion
    c. Type of government
    d. Type of dress
    e. Diet
    f. Any distinctive characteristics
2. Compare the role and rights of women among the Bedouins of the Sahara Desert with the role of women in the United States. Rese and discuss. Role-play situations which will effectively point the differences.

3. Cite the reasons why India had to divide into the Republic of Pakistan and the Republic of India.

4. Role-play the caste system of India. Have students maintain their roles for an entire period.

5. Research the slave/master relationship among the Bantu and Pgymies of Africa. Show how this relationship benefits both grou

6. Through role playing, contrast South Africa's apartheid policy wit segregation as it exists in the U.S.

7. Answer the following questions about number six:

   a. How and why did these two systems evolve?
   b. What perpetuated each?
   c. Have they changed in any way in the last five years? How? Why or why not?

8. Through pictures and displays contrast the Eskimo and the Lapps of northern Europe.

9. Debate a theory such as: "Climate Affects the Development of a People".

10. Construct a world map showing average annual temperature and precipatation.

11. Construct a world map showing major agricultural products.

12. Make a display of the major crops of each climatic region.

13. Assign exercises using latitude and longitude for locating cities.

Evaluation: The effectiveness of the unit and the students' understanding will be demonstrated by their ability to carry out the proposed activities. In addition, the following means of evaluation may be used:

1. Map exercises which test students' knowledge of the location of the major countries and features of the world.
2. Short answer tests to test students knowledge of the regions in which specific crops grow, minerals are found, etc.
3. Oral reports and/or discussions following research on assigned regions or countries.
4. Given location points, connect the points, to locate a place such as South America.
5. Concepts concerning power plays among nations will be tested with essay exams.

Unit I Awareness

Woodworking

Purposes:

1. To develop an insight and understanding of the wood industries and their place in our culture

2. To discover talents aptitudes, and potentialties of individuals to engage in technical pursuits

3. To become aware of the many occupations involved in the construction and manufacturing industries

Objectives: After students have completed this unit, they will be able to:

1. Demonstrate proper safety precautions and practices in the workshop and on the job

2. List ten physical requirements of the Construction worker

3. Make a list of the common tools and machines of one of the building trades involved in construction.

4. Discuss intelligently the importance of urban and suburban construction and planning as they may affect our environment.

5. Explain the function of management, personnel, and production.

Activities: To accomplish these objectives, the students may engage in such activities as:

1. View a film, "Safety in the School Shop", then:

   a. Read the chapter on safety precaution, General Woodworking by Groneman.

   b. Demonstrate to the class proper safety practices in using shop tools and machines.

2. Research job requirements of the construction worker and make a written report.

3. Divide the class into study groups. Make a study of the tools and machines of the building trades involved in the complete construction of a house.

   Ref: The Film: The Building Trades
   Book: The World of Construction

4. Write a paper on Modern Construction and Environment, with particular emphasis on Metropolitan Washington, D.

5. Research and role-play the following as each relates to the construction industry:

    a. Management Technology
    b. Personnel Technology
    c. Production Technology

6. Make a flow chart of each of the above, explaining their functions.

Materials:

1. Film : "The Building Trades"
2. Filmstrips: "The World of Construction"
3. Transparencies: Construction
   Woodworking tools
4. Overhead projector
5. Filmstrip Projector

Tie in with other subject areas:

Science 1, 3
Math 1, 3
English 4
Soc. Stud. 4, 5
Phy. Ed. 2

Vocabulary:

Technology
Industry
Personnel
Production
Management
Union
Specification
Subcontract
Feasibility
Research
Environment
Permit
Requirement

Careers in the Building Trades

The building trades are our number one industry in the United States; Construction is a sixty billion dollar industry. It provides one out of every ten jobs in the U. S. A. and represents one sixth of all our industrial workers employing more than three million workers.

Careers in the Building Industry

Asbestos and insulating workers
Bricklayers
Carpenters
Cement Finishers
Common laborers
Electricians
Elevator Constructors
Glaziers
Helpers
Lathers

Marble, tile and terrazzo setters
Machine operators
Operating engineers
Painters and Paperhangers
Plasterers
Plumbers and Pipefitters
Roofers
Sheetmetal workers
Stonemasons
Structural iron workers
Ornamental Iron Workers
Reinforced iron workers

Carpenters are engaged in providing the ground work for most of these craftsmen.

Evaluation:

1. Given a set of pictures, students will be asked to select those which show unsafe working conditions, tell exactly why or in what way the situation is unsafe, and suggest a method to correct the condition.

2. On a short written quiz, student knowledge of the physical requirements of the construction worker and the tools and machines of the building trades will be tested.

3. Objective number four is self-evaluating.

4. Objective number five will be evaluated by assessing the effectiveness of student performance in Activity number five.

Career Development Curriculum Guide: Grade 9
Unit III - Exploration

First Semester

Woodworking

Purposes:

1. To give instruction on the fundamental processes in hand woodworking with stress on student participation in shop activities.

2. To give students the opportunity to use small machines.

3. To give opportunities to students to discover their interest and talent in woodworking.

Objectives: Upon the completion of this unit the student should be able to:

1. Read a working drawing.
2. Make a shop plan.
3. Measure, cut, and square stock to a given size with a satisfactory degree of accuracy.
4. Cut curves and designs using a coping saw or a jig saw.
5. Surface, shape, and fit stock.
6. Bore and cut holes properly to given sizes.
7. Make several of the common wood joints, such as: rabbet, dowel, and butt joints.
8. Assemble parts, using nails, screws, dowels, and glue.
9. Prepare the surface for finishing.
10. Apply a suitable finish properly.

Activities: These objectives can best be obtained through the construction of shop projects - simple to complex.

1. Select a simple project and determine the number of parts and the size or dimensions of each
2. A sketch the project from three angles or views: top, front, and end and make a picture like drawing (pictori
   B Measure and cut patterns the actual size of the part.
3. Trace patterns on stock; cut and shape it to the size of the patterns. (Note: first projects should require the use of hand tools only)
4. Cut irregular curves with a coping saw and smooth it with the wood files.
5. Fit the parts together with the trial method.
6. Select and bore holes with the proper tools (Hand drill or Brace & Bit.)
7. Study the wood joints and determine what joints are used where in industry and why.
8. Identify the wood fasteners and explain their uses.
9. Demonstrate the proper uses of wood abrasives; then prepare the surfaces for finishing of your project.
10. A. Apply a shellac finish on project - 1
    B. Apply a stain varnish on project - 2
    C. Apply a spray finish on project - 3

Unit III - Exploration

Note - The advantages and disvantages of the three types of applications.

Materials: Lumber, finishes, fasteners, and abrasives:

Tools: Woodworking Hand tools and Machines

- Rulers
- Saws
- Squares
- Planes
- Rasp
- Screwdrivers
- Hammers
- Files
- Hand drills
- Braces and Bits
- Clamps
- Brushes
- Spray gun
- Circular saw
- Scroll saw
- Band Saw
- Disc-Belt Sander

Tie-in with other subjects

English	1-10
Math	1-8
Science	9-10

Vocabulary:

- Stock
- Tool
- Machine
- Portable
- Surfacing
- Fasteners
- Thinners
- Solvent
- Bore vs. Drill
- Penetrate
- graduated
- By products
- Squared
- Joinery

Career Opportunities:

- Carpenters
- Cabinet maker
- Form builders
- Pattern maker
- Boat Builder
- Mill man
- Forester
- Foreman
- Maintenance Men
- Architect
- Furniture Designer
- Wood finishers
- Wood carver
- Inspector
- Interior designer
- Contractor
- Supervisor

Evaluation:

The Objectives of this unit will be evaluated through the projects constructed by the students during the course of the unit.

Unit III- Exploration

References:

Smith & Maddox Elements of American Industry

Gerbracht & Robinson, Understanding America's Industries.

Feirer, I.A. Bench Woodwork.

Feirer, Industrial Arts Woodworking

Groneman, General Woodworking

Lux & Ray, The World of Construction

Wo-6